
Regulation No. 1

Particulate Matter, Smoke, Carbon Monoxide and Sulfur Oxides

Colorado Air Quality
Control Commission



Colorado Department
of Public Health
and Environment

REGULATION NO. 1

Emission Control Regulation for Particulate Matter, Smoke, Carbon Monoxide and Sulfur Oxides

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Revised: June 24, 1993
Effective: August 30, 1993

Revised and Readopted: August 19, 1993
Effective: October 30, 1993

Revised: June 16, 1994
Effective: August 30, 1994

Revised: September 22, 1994
Effective: November 30, 1994

Revised and Readopted: August 17, 1995
Effective: October 30, 1995

Revised: December 23, 1996
Effective: March 2, 1997

Revised: July 17, 1998
Effective: September 30, 1998

Revised: April 19, 2001
Effective: June 30, 2001

Revised: August 16, 2001
Effective: September 30, 2001

Revised: January 17, 2002
Effective: March 2, 2002

Regulation No. 1

EPA test methods 1-4, 6, 6a, 6b, 6c and method 8 (40 CFR 60.275, Appendix A, Part 60) are hereby incorporated by reference by the Air Quality Control Commission and made a part of the Colorado Air Quality Control Commission Regulations. Materials incorporated by reference are those in existence as of the date of this regulation and do not include later amendments. The material incorporated by reference is available for public inspection during regular business hours at the Office of the Commission, located at 4300 Cherry Creek Drive South, Denver, Colorado 80246, or may be examined at any state publications depository library. Parties wishing to inspect these materials should contact the Technical Secretary of the Commission, located at the Office of the Commission.

DEFINITIONS

ASTM

American Society for Testing and Materials

EPA

United States Environmental Protection Agency

Fugitive Emissions

Emissions which cannot be reasonably collected and passed through a stack, chimney, vent or other equivalent opening.

gr/dscf

Grains per dry standard cubic foot

Haul Roads

Roads which are used for commercial, industrial or governmental hauling of materials and which the general public does not have a right to use.

Intermittent Sources

Those stationary sources of air pollution which do not operate on a continuous basis for a period of time sufficient to allow for opacity observations in accordance with EPA Method 9.

PM

Particulate Matter

Roadways

Roads, other than haul roads, used for motorized vehicular traffic.

Welfare

As used in these regulations, effects on public welfare include, but are not limited to, effects on soils, water, crops, vegetation, manmade materials, animals, wildlife, weather, visibility, and climate, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.

REGULATION NO. 1

Emission Control Regulations for Particulate Matter, Smoke, Carbon Monoxide, and Sulfur Oxides for the State of Colorado

I. APPLICABILITY: REFERENCED FEDERAL REGULATIONS

- A. The provisions of this Regulation No. 1 are applicable to both new and existing sources and without regard to whether a source has been issued an emission permit. Except where specifically made applicable to attainment or nonattainment areas, the requirements set forth herein apply statewide. (Areas designated as unclassifiable shall be treated as attainment). The provisions of this regulation apply to a source even though it may also be subject to other regulations of the Commission; and in the event the requirements of this regulation conflict or are inconsistent with the requirements of any other regulation of the Commission, the more stringent emission limitations shall apply except that a specific emission limitation for a particular source shall take precedence over a general emission limitation which is inconsistent.
- B. At several places in this regulation various federal regulations, performance standards, and procedures which have been previously published in the Federal Register and/or the Code of Federal Regulations have been incorporated by reference. This regulation provides appropriate citations to such materials and incorporates them as they are published. Amendments to such regulations, standards and procedures made after the effective date of this regulation are not incorporated herein. Copies of said materials may be obtained for a nominal copying fee from the Technical Secretary to the Commission at the Air Quality Control Commission office at 4300 Cherry Creek Drive South, B-1, Denver, CO 80246. Copies are also available at the Commission office for public inspection at no cost.

II. SMOKE AND OPACITY

A. Stationary Sources

1. Except as provided in paragraphs 2 through 6 below, no owner or operator of a source shall allow or cause the emission into the atmosphere of any air pollutant which is in excess of 20% opacity. This standard is based on 24 consecutive opacity readings taken at 15-second intervals for six minutes. The approved reference test method for visible emissions measurement on which these standards are based is EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992)) in all subsections of Section II. A and B of this regulation.

2. Intermittent Sources

Except as provided in paragraphs 3 through 6 below, no owner or operator of an intermittent source shall allow or cause the emission into the atmosphere of any pollutant which is in excess of 20% opacity. If EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992)), a continuous emissions monitor, or other credible method is used and 24 consecutive opacity readings taken at 15-second intervals cannot be taken because such a source does not operate continuously for six minutes, the readings shall be taken at 15-second intervals during periods of operation until 24 readings have been made or for a period of thirty minutes, whichever is sooner, and the source shall be deemed in violation if the average opacity of such readings exceed 20%.

3. Pilot Plants and Experimental Operations

No owner or operator of a process unit of a pilot plant or experimental operation shall emit or cause to be emitted into the atmosphere from any such process unit particulate matter for a period or periods aggregating more than six minutes in any consecutive minutes which is in excess of 30% opacity.

Except as otherwise provided in this paragraph this emission standard for pilot plants and experimental operations shall be applicable for a period not to exceed 180-operating days cumulative total from the date operation of such a process unit commences; thereafter the 20% opacity limitation provided in Section II.A.1 or 2 of these regulations shall apply to emissions from such a process unit of a pilot plant or experimental operation. For the purpose of this Section II.A.3 "Operating Days" shall mean any calendar day during which the process unit is operated and air pollutants are emitted (without regard to the length of period of time operated or amount of pollutants emitted). For good cause shown, the Division may extend the period of relaxed operation beyond 180 operating days for the operation of a

process unit, but in no event to greater than 365 operating days without the concurrence of the Commission.

4. Fire Building, Cleaning of Fire Boxes, Soot Blowing, Start-up, Process Modification or Adjustment of Control Equipment Except as provided in Sections II.A.6, no owner or operator of a source shall allow or cause to be emitted into the atmosphere any air pollutant resulting from the building of a new fire, cleaning of fire boxes, soot blowing, start-up, any process modification, or adjustment or occasional cleaning of control equipment, which is in excess of 30% opacity for a period or periods aggregating more than six minutes in any sixty consecutive minutes.

5. Smokeless Flare or Flares for the Combustion of Waste Gases

No owner or operator of a smokeless flare or other flare for the combustion of waste gases shall allow or cause emissions into the atmosphere of any air pollutant which is in excess of 30% opacity for a period or periods aggregating more than six minutes in any sixty consecutive minutes.

6. Exemptions

The requirements of Section II.A.1 and 2 of this regulation shall not apply to the following sources or types of emissions:

- (i) Emissions from fireplaces, fireplace inserts and stoves, provided such devices are burning only clean dry wood or wood products and are used for noncommercial or recreational purposes.
- (ii) Fugitive dust: As used in this Regulation No. 1, "fugitive dust" means airborne particulate matter which is not a direct or proximate result of man's activities.
- (iii) Fugitive particulate emissions: As used in this Regulation No. 1, "fugitive particulate emissions" mean fugitive emissions of particulate matter that are the direct or proximate result of man's activities, (e.g., Materials left by man exposed to the wind or later acted upon by another force as the wind or automobile traffic, or particulate matter being thrown into the atmosphere by the operation of a bulldozer.)

B. Diesel Powered Locomotives

1. Except as provided in paragraph 2 below, no owner or operator shall emit or cause to be emitted into the atmosphere from any diesel-powered locomotive

any air pollutant which is in excess of 20% opacity while being operated below 6,000 feet (mean sea level) and 30% opacity while being operated above 6,000 feet (mean sea level).

2. Exceptions

- a. Emissions which exceed the opacity limits of Section II.B.1. as a result of a cold engine start-up, not to exceed thirty consecutive minutes and provided the locomotive is in a stationary position.
- b. Emissions for nonconsecutive periods of three minutes with an aggregate of not more than ten minutes in any consecutive sixty minutes when a locomotive engine is being tested, adjusted, rebuilt, or repaired in the maintenance yards.
- c. Emissions for periods of up to four minutes when a locomotive is accelerated after standing still.

3. The owner or operator of any diesel-powered locomotive that has been cited for violation of Section II.B.1. of this regulation, but which is not available for a compliance inspection shall submit to the Division an affidavit attesting to those abatement measures which have been completed and shall state in that affidavit that the vehicles cited have achieved compliance with this regulation.

C. Military Smokes and Obscurants Training Exercises

Emissions associated with the generation of fog oil smoke and the use of other short duration military smokes, of twelve minutes or less, on United States Army Installation Fort Carson and Piñon Cañon Maneuver Site (PCMS) by United States military forces, or allied forces in a joint training exercise with the United States, shall be exempt from the opacity limits specified in Regulation No. 1, sections II. and III. provided that all of the following conditions are met:

1. All participants in the training shall follow all applicable Fort Carson training manuals and guidance regarding fog oil and other military smokes and obscurants;
2. A 3 kilometer buffer zone shall be established and maintained, in which smoke generation shall not occur. This buffer zone shall be contained wholly within Fort Carson and PCMS respectively for the entire perimeter;
3. Smoke generation shall cease immediately if such smoke crosses or if such smoke is in danger of crossing the boundary of the military reservation or if

meteorological conditions are expected to change in a way that would transport existing smoke plumes across the Installation or Site boundary;

3. The commander in charge of any training involving obscurants shall post an observer to determine when a training exercise should be halted due to an increased potential for smoke to drift across the Installation or Site boundary;
4. Total fog oil usage at Fort Carson shall not exceed 1540 gal/day;
5. Total fog oil usage at the Piñon Cañon Maneuver Site shall not exceed 1540 gal/day;
6. Fort Carson shall maintain records of each fog oil smoke generation exercise which shall include:
 - a. observations from the designated observer(s) regarding the drift of the fog oil smoke only when said smoke approaches the Installation or Site boundary to the extent that all generation must cease to prevent visible emissions from crossing the boundary;
 - b. the amount of fog oil used in gal/day;
 - c. the general location at which the fog oil smoke was generated; and
 - d. the date and duration of the fog oil smoke generation; and
7. For purposes of this section, fog oil is defined as highly refined (hydro-treated) virgin oil.

The Commanding General in charge of Fort Carson shall be responsible for ensuring that no drift of smoke from fog oil generation or other obscurant use occurs across the boundary of the military reservations, even if generated in accordance with this section.

III. PARTICULATE MATTER

A. Fuel Burning Equipment

1. No owner or operator shall cause or permit to be emitted into the atmosphere from any fuel-burning equipment, particulate matter in the flue gases which exceeds the following:
 - a. 0.5 lbs. per 10^6 BTU heat input for fuel burning equipment of less than or equal to 1×10^6 BTU/hr. total heat input design capacity.

- b. For fuel burning equipment with designed heat inputs greater than 1×10^6 BTU per hour, but less than or equal to 500×10^6 BTU per hour, the following equation will be used to determine the allowable particulate emission limitation.

$$PE = 0.5(FI)^{-0.26}$$

Where:

PE = Particulate Emission in Pounds per million BTU heat input.

FI = Fuel Input in Million BTU per hour.

- c. 0.1 lbs. per 10^6 BTU heat input for fuel burning equipment of greater than 500×10^6 BTU per hour or more.
- d. If two (2) or more fuel burning units connect to any opening, the maximum allowable emission rate shall be calculated on a lb/million heat input (BTU) basis as calculated from a weighted average of the individual allowable limits for each unit ducting to the common stack.

2. Performance Tests

Prior to granting of a final approval permit or amending a permit, when an emission source or control equipment is altered, or at any time when there is reason to believe that emission standards are being violated, the Division may require the owner or operator of any fuel burning equipment to conduct performance tests, as measured by EPA Methods 1-4 and the front half of EPA Method 5 (40 CFR 60.275, Appendix A, Part 60), or other credible method approved by the Division, to determine compliance with this subsection of this regulation. The particulate emission standards contained in this subsection do not include condensible particulate matter, or the back half emissions of EPA Method 5.

B. Incinerators

1. No owner or operator of an incinerator shall operate any incinerator without a permit from the Division.
2. Standard of Performance for all incinerators other than biomedical waste incinerators.

- a. In areas designated as nonattainment for particulate matter, no owner or operator of an incinerator shall cause or permit emissions of more than 0.10 grain of particulate matter per standard cubic foot. (Dry flue gas corrected to 12 percent carbon dioxide.)
- b. In areas designated as attainment for particulate matter, no owner or operator of an incinerator shall cause or permit emissions of more than 0.15 grain of particulate matter per standard cubic foot. (Dry Flue gas corrected to 12 percent carbon dioxide.)

3. Performance Tests

Prior to granting a final approval permit or amending a permit, when an emission source or control equipment is altered, or at any time when there is reason to believe that emission standards are being violated, the Division may require the owner or operator of an incinerator to conduct performance test(s) in accordance with Appendix A of Air Quality Control Commission Regulation No. 6.

4. Standard of Performance for Biomedical Waste Incinerators.

The owner or operator of an existing incinerator used for the disposal of biomedical waste shall comply with Part B, Section V of Regulation No. 6. Standard of Performance For New Biomedical Waste Incinerators as follows:

- a. All incinerators, existing as of the effective date of Part B, Section V of Regulation No. 6, with a design rate of four hundred pounds per hour and greater must comply with the requirements of this regulation.
- b. All incinerators, existing as of the effective date of Part B, Section V of Regulation No. 6, with a design capacity of less than four hundred pounds per hour must comply with the requirements of this regulation as applicable; except incinerators with a design capacity of less than 200 pounds per hour shall be permitted and allowed to operate only so long as the units continue to meet the particulate and visible emission standards existing prior to the effective date of Part B, Section V of Regulation No.6, the manufacturer's design specifications and any other applicable safety standards. (The standards existing prior to the effective date of this regulation are: a) For sources existing prior to January 30, 1979: 20% opacity and 0.10 grains per dry standard cubic foot (gr/dscf) of PM for PM non-attainment areas and 0.15 gr/dscf of PM for PM attainment areas; b) 20% opacity and 0.10 gr/dscf of PM for sources constructed after January 30, 1979.)

C. Manufacturing Processes

1. Except as provided in paragraphs 2 and 3 of this subsection C., no owner or operator of a manufacturing process unit shall cause or permit emission of any particulate matter into the atmosphere during any consecutive sixty minute period which is in excess of the following.

- a. For process equipment having process weight rates of 30 tons per hour or less, the allowable emission rate shall be determined by the use of the equation:

$$PE = 3.59(P)^{0.62}$$

Where:

PE = Particulate Emission in lbs. per hour

P = Process weight rate in tons per hour

- b. For process equipment having process weight rates of greater than 30 tons per hour, the allowable emission rate shall be determined by use of the equation:

$$PE = 17.31(P)^{0.16}$$

Where:

PE = Particulate Emission rate in lbs. per hour

P = Process weight rate in tons per hour

- c. If two or more process units are connected to the same opening, the maximum allowable emission rate shall be computed by summing the allowable emissions for the units being operated.

2. Exceptions

Fugitive dust and fugitive particulate emissions as defined in Section II.A.6 of this Regulation.

3. Performance Tests

Prior to granting of a final approval permit or amending a permit, when an emission source or control equipment is altered, or at any time when there is

reason to believe that emission standards are being violated, the Division may require the owner or operator of any manufacturing process to conduct performance tests, as measured by EPA Methods 1-4 and the front half of EPA Method 5 (40 CFR 60.275, Appendix A, Part 60), or other credible method approved by the Division, to determine compliance with this subsection of this regulation. The particulate emission standards contained in this subsection do not include condensable particulate matter, or the back half emissions of EPA Method 5 (40 CFR 60.275, Appendix A, Part 60).

C. Fugitive Particulate Emissions

1. General Requirements

a. Existing Sources

- (i) Every owner or operator of a source or activity which is subject to this Section III.D. shall employ such control measures and operating procedures as are necessary to minimize fugitive particulate emissions into the atmosphere through the use of all available practical methods which are technologically feasible and economically reasonable and which reduce, prevent and control emissions so as to facilitate the achievement of the maximum practical degree of air purity in every portion of the State.
- (ii) In determining what control methods are available, practical, economically reasonable and technologically feasible, the following factors shall be considered: effects on the health, welfare (as defined in Section I.G. of the Common Provisions regulation), convenience, and comfort of the inhabitants of the State of Colorado; effects on the enjoyment and use of the scenic and natural resources of the State; the impact on normal operating procedures; altitude, topography, climate, and anticipated meteorological conditions (including wind and precipitation); soil conditions; the degree to which a type of emission to be controlled is significant; the continuous, intermittent, or seasonal nature of the emission, the economic, environmental, and energy impacts and other costs of compliance; the proximity of the source or activity to populated areas; and the nature, scope and duration of the source or activity.
- (iii) This Section III.D. shall be enforceable only through the procedures specified below in Section III.D.1.b. through III.D.1.e.

b. New Sources

Every owner or operator of a new source or activity which is subject to this Section III.D. and which is required to obtain an emission permit under Regulation No. 3 shall submit a fugitive particulate emission control plan meeting the requirements of this Section III.D. at such time as, and as part of, the required permit application. Such

plan shall be approved or disapproved by the Division in the course of acting to approve or disapprove the permit application and no emission permit shall be issued until a fugitive particulate emission control plan has been approved.

c. Emission Limitation Guidelines for Submission of Control Plan.

If the Division determines that a source of activity which is subject to this Section III.D. (whether new or existing) is operating with emissions in excess of 20% opacity and such source is subject to the 20% emission limitation guideline; or if it determines that the source or activity which is subject to this Section III.D. is operating with visible emissions that are being transported off the property on which the source is located and such source is subject to the no off property transport emission limitation guideline; or if it determines that any source or activity which is subject to this Section III.D. is operating with emissions that create a nuisance; it shall require the owner or operator of that source or activity to submit a written plan to the Division for the control of fugitive particulate emissions within the time period specified in Section III.D. Provided, however, that in the case of a source or activity which already has a control plan, the Division shall review said control plan and if it determines the plan does not meet the requirements of this Section III.D., it shall require the submission of a revised control plan. (As used herein, "nuisance" shall mean the emission of fugitive particulates which constitutes a private or public nuisance as defined in common law, the essence of which is that such emissions are unreasonable interfering with another person's use and enjoyment of his property. Such interference must be "substantial" in its nature as measured by a standard that it would be of definite offensiveness, inconvenience, or annoyance to a normal person in the community.)

[Cross Reference: Appendices A and B]

d. Control Plans

- (i) With respect to operations or activities which have more than one source of fugitive particulate emissions, submission of control plans or plan revisions pursuant to Section III.D. shall be required only with respect to those individual sources for which there does not exist a currently approvable control plan and which are not being operated in accordance with the requirements of this Section III.D., provided, however, that control plans required by Section III.D.1.b for new sources and activities shall contain provisions for control of fugitive

particulate emissions from all significant sources of such emissions.

- (ii) Sources required to submit control plans for revisions to the Division shall do so within sixty days of the date such plan or revision is requested; provided, however, that the Division, in its discretion, may where appropriate establish a different time period for submittal, taking into consideration such factors as the duration of the operation of the source or activity, the significance and nature of the emissions, and the relative complexity of the operation and applicable control methods.
- (iii) Each control plan shall include all available practical methods which are technologically feasible and economically reasonable and which reduce, prevent and control fugitive particulate emissions from the source or activity into the atmosphere. For those materials, equipment, services or other resources (such as water for abatement and control purposes) which are likely to be scarce at any given time, an alternative control method must be included in the control plan. Any source required to submit a control plan may ask for a "control plan conference" with the Division, and if so requested the Division shall hold such a conference for the purpose of advising what types of control measures and/or operating procedures will meet the requirements of this section.

[Cross Reference: Sections III.D.2.a. through III.D.2.k.]

- (iv) The Division shall approve any plan submitted under this Section III.D., unless the Division determines that the plan does not meet the requirements of Section III.D. If a control plan is not approvable in its entirety, the Division shall approve those portions which meet the requirements of this section and disapprove those portions which fail to meet the requirements of this section.

e. Enforcement

- (i) It shall be a violation of this regulation and the Division may take enforcement action pursuant to C.R.S. 1973, 25-7-115, as amended, if the owner or operator:
- (ii)
 - (A) Fails to submit a control plan (or revision of an existing plan) within sixty days (or other time period specified by the Division) after being notified by the Division that such submittal is required unless operation of such source is discontinued so as to permanently eliminate the cause of fugitive particulate emissions there from; or
 - (B) Owns or operates a source or activity for which the Division has disapproved a control plan or a revised control plan unless operation of such source is discontinued so as to permanently eliminate the cause of fugitive particulate emissions there from; or
 - (C) Fails to comply with the provisions of an approved control plan.
- (iii) The 20% opacity, no off-property transport, and nuisance emission limitation guidelines of this Section III.D. are not enforceable standards and no person shall be cited for violation thereof pursuant to C.R.S. 1973, 25-7-115 as amended.

2. Sources Subject to Section III. D.

The control measures and operating procedures listed in Sections III.D.2.a. through III.D.2.k. are generally considered appropriate for the specific types of sources under which they are listed - at least as applied individually. Whether they remain appropriate when used in combination with other measures and procedures, must be determined on a case-by-case basis.

a. Roadways

- (i) Unpaved
 - (A) Applicability - Attainment and Nonattainment Areas

(B) General Requirement

Any owner or operator responsible for construction or maintenance of any (existing or new) unpaved roadway which has vehicle traffic exceeding 200 vehicles per day in attainment areas or 150 vehicles per day in nonattainment areas (averaged over any consecutive 3-day period) from which fugitive particulate emissions will be emitted shall be required to use all available, practical methods which are technologically feasible and economically reasonable in order to minimize emissions resulting from the use of such roadway in accordance with the requirements of Section III.D. of this regulation.

(C) Applicable Emission Limitation Guideline

The nuisance emission limitation guideline shall apply to unpaved roadways. Abatement and control plans submitted for unpaved roadways shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

(D) Control Measures and Operating Procedures

Control measures or operations procedures to be employed may include but are not necessarily limited to, watering, chemical stabilization, road carpeting, paving, suggested speed restrictions and other methods or techniques approved by the Division.

(E) If the Division receives a complaint that any new or existing unpaved roadway is creating a nuisance, it may require persons owning or operating or maintaining such roadways to supply vehicle traffic count information by any reasonable available means for the purpose of determining if they have sufficient traffic to subject them to the requirements of this Section III.D.

(ii) Paved

(A) Applicability - Attainment and Nonattainment Areas

(B) General Requirement

Any person who through operations or activities repeatedly deposits materials which may create fugitive particulate emissions on a public or private paved roadway is required to submit a control and abatement plan upon request by the Division which provides for the removal of such deposits and appropriate measures to prevent future deposits such that fugitive particulate emissions which may result are minimized; except that sand, salt or other materials may be dropped on snow or ice covered roadways for the purpose of safety and such deposits shall not be required to be removed on a more frequent basis than the community's normal street cleaning schedule except as otherwise provided in an applicable SIP provision.

(C) Applicable Emission Limitation Guideline

The nuisance emission limitation guideline shall apply to paved roadways. Abatement and control plans submitted for paved roadways shall be evaluated for compliance with the requirements of section III.D. of this regulation.

(D) Control Measures and Operating Procedures

Control measures or operational procedures to be employed may include but are not necessarily limited to, covering the loaded haul truck, washing or otherwise treating the exterior of the vehicle, limiting the size of the load and the vehicle speed, watering or treating the load with chemical suppressants, keeping the roadway access point free of materials that may be carried onto the roadway, removal of materials from the roadway and other methods or techniques approved by the Division.

b. Construction Activities

(i) Applicability - Attainment and Nonattainment Areas

(ii) General Requirement

Any owner or operator engaged in clearing or leveling of land or owner or operator of land that has been cleared of greater than five acres in attainment areas or one (1) acre in nonattainment areas from which fugitive particulate emissions will be emitted shall be required to use all available and practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

(iii) Applicable Emission Limitation Guideline

Both the 20% opacity and the no off-property transport emission limitation guidelines shall apply to construction activities; except that with respect to sources or activities associated with construction for which there are separate requirements set forth in this regulation, the emission limitation guidelines there specified as applicable to such sources and activities shall apply. Abatement and control plans submitted for construction activities shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

[Cross Reference: Subsections e. and f. of Section III.D.2. of this regulation.]

(iv) Control Measures and Operating Procedures

Control measures or operational procedures to be employed may include, but are not necessarily limited to, planting vegetation cover, providing synthetic cover, watering, chemical stabilization, furrows, compacting, minimizing disturbed area in the winter, wind breaks and other methods or techniques approved by the Division.

c. Storage and Handling of Materials

(i) Applicability - Attainment and Nonattainment Areas

(ii) General Requirement

Any owner or operator or any new or existing materials storage and handling operation from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

(iii) Applicable Emission Limitation Guideline

Both the 20% opacity and the no off-property transport emission limitation guidelines shall apply to storage and handling operations. Abatement and control plans submitted for storage and handling operations shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

(iv) Control Measures And Operating Procedures

Control measures or operational procedures to be employed may include, but are not necessarily limited to, the use of enclosures, covers, stabilization, compacting, watering, limitation of fines and other methods or techniques approved by the Division.

d. Mining Activities

(i) Applicability - Attainment and Nonattainment Areas

(ii) General Requirements

Any owner or operator of any new or existing mining operation from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

(iii) Applicable Emission Limitation Guideline

Both the 20% opacity and the no off-property transport emission limitation guidelines shall apply to mining activities' except that with respect to sources or activities associated with mining for which there are separate requirements set forth in this regulation, the emission limitation guidelines there specified as applicable to such sources and activities shall apply. Abatement and control plans submitted for mining activities shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

(iv) Control Measures and Operating Procedures

Control measures or operating procedures to be employed may include, but are not necessarily limited to:

- (A) watering or chemical stabilization of unpaved roads as often as necessary to minimize re-entrainment of fugitive particulate matter from the road surface, or paving of roads;
- (B) prompt removal of coal, rock minerals, soil, and other dust-forming debris from paved roads and scraping and compaction of unpaved roads to stabilize the road surface as often as necessary to minimize re-entrainment of fugitive particulate matter from the road surface;
- (C) restricting the speed of vehicles in and around the mining operation;
- (D) revegetating, mulching, or otherwise stabilizing the surface of all areas adjoining roads that are a source of fugitive particulate emissions;
- (E) to the extent practicable restricting vehicular travel vehicles to established roads;
- (F) enclosing, covering, watering, or otherwise treating loaded haul trucks and railroad cars, or limiting size of load, to minimize loss of material to wind and spillage;
- (G) substitution of conveyor systems for haul trucks;

- (H) minimizing the area of disturbed land;
- (I) prompt revegetation of disturbed surface areas;
- (J) planting of special wind break vegetation at critical points;
- (K) restricting the areas to be blasted at any one time;
- (L) reducing the period of time between initially disturbing the soil and revegetating or other surface stabilization;
- (M) control of fugitive particulate emissions from storage piles through use of enclosures, covers, or stabilization, minimizing the slope of the upwind face of the pile, confining as much pile activity as possible to the downwind side of the pile and other methods or techniques as approved by the Division.

[Cross Reference: Subsections a., b., c., e., f., g., and i. of Section III.D.2. of this regulation.]

e. Haul Roads

- (i) Applicability - Attainment and Nonattainment Areas
- (ii) General Requirement

Any owner or operator of any new or existing haul road which has vehicle traffic exceeding 40 haul vehicles or 200 total vehicles per day (averaged over any consecutive 3-day period) from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

- (iii) Applicable Emission Limitation Guideline

The no off-property transport emission limitation guideline shall apply to on-site haul roads (i.e., those located on and abutted by the property owned or under control of the owner or operator of the haul road) and the nuisance

guideline shall apply to off-site haul roads (i.e., those abutted on both sides by property not owned or under the control of the owner or operator of the haul road). Abatement and control plans submitted for haul roads shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

(iv) Control Measures and Operating Procedures

Control measures and operational procedures to be employed may include, but are not necessarily limited to, the use of vehicular speed reduction, watering, chemical stabilization, road carpeting and other methods of techniques approved by the Division.

(v) The Division may require persons owning or operating or maintaining any new or existing haul roads to supply vehicle traffic count information by any reasonable available means for the purpose of determining if they have sufficient traffic to subject them to the requirements of this Section III.D.

f. Haul Trucks

(i) Applicability - Attainment and Nonattainment Areas

(ii) General Requirement

Any owner or operator of any new or existing haul trucks from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

(iii) Applicable Emission Limitation Guideline

The no off-property transport emission limitation guideline shall apply to haul trucks; except that when operating off the property of the owner or operator, the applicable guideline shall be no off-vehicle transport of visible emissions. Abatement and control plans submitted for haul trucks shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

(iv) Control Measures and Operating Procedures

Control measures or operation procedures to be employed may include but are not necessarily limited to, covering the materials, washing or otherwise treating loaded haul trucks to remove materials from the exterior of the vehicle prior to transporting materials, limiting load size, wetting the load and other methods or techniques approved by the Division.

[Cross Reference: C.R.S. 1973, Section 42-4-1208]

g. Tailings Piles and Ponds

(i) Applicability - Attainment and Nonattainment Areas

(ii) General Requirement

Any owner or operator of any new or existing tailings piles and ponds from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

(iii) Applicable Emission Limitation Guideline

Both the 20% opacity and the no off-property transport emission limitation guidelines shall apply to tailings piles and ponds. Abatement and control plans submitted for tailings piles and ponds shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

(iv) Control Measures and Operating Procedures

Control measures or operational procedures to be employed may include, but are not necessarily limited to:

- (A) watering and/or chemical stabilization,
- (B) synthetic and/or revegetative covers,
- (C) wind breaks,
- (D) minimizing the area of disturbed tailings,
- (E) restricting the speed of vehicles in and around the tailings operation, and/or,
- (F) other equivalent methods or techniques approved by the Division.

h. Demolition Activities

- (i) Applicability - Nonattainment Areas
- (ii) General Requirements

Any owner or operator of any new demolition activities from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

- (iii) Applicable Emission Limitation Guideline

Only the no off-property transport emission limitation guideline shall apply to demolition activities. Abatement and control plans submitted for demolition activities shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

- (iv) Control Measures and Operating Procedures

Control measures or operational procedures to be employed may include, but are not limited to:

- (A) wetting down, including pre-watering of work surface,

- (B) removal of dirt and mud deposited on improved streets and roads,
 - (C) wetting down, washing, or covering haulage equipment when necessary to minimize fugitive dust emissions during loading and transit.
- (v) Any demolition or renovation activity that has materials insulated or fireproofed with friable asbestos will also be subject to the provisions of the Air Quality Control Commission's Regulation No. 8, Part B.

i. Blasting Activities

- (i) Applicability - Attainment and Nonattainment Areas
- (ii) General Requirement

Any owner or operator of any new or existing blasting activities from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

- (iii) Applicable Emission Limitation Guideline

Only the no off-property transport emission limitation guideline shall apply to blasting activities. Abatement and control plans submitted for blasting activities shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

- (iv) Control Measures and Operating Procedures

Control measures or operational procedures to be employed may include, but are not limited to, the use of:

- (A) the removal of overburden prior to blasting,
- (B) watering down the blasted area as soon as practicable after blasting,

- (C) other equivalent methods or techniques approved by the Division.

j. Sandblasting Operations

- (i) Applicability - Attainment and Nonattainment Areas
- (ii) General Requirement

Any owner or operator of any new or existing sandblasting activities from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

- (iii) Applicable Emission Limitation Guideline

Only the 20% opacity emission limitation guideline shall apply to sandblasting operations. Abatement and control plans submitted for sandblasting operations shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

- (iv) Control Measures and Operating Procedures

Control measures and operating procedures to be employed may include, but are not limited to the use of enclosures with necessary dust collecting equipment, using wet sandblasting methods, and other methods or techniques approved by the Division.

k. Livestock Confinement Operations

- (i) Applicability - Attainment and Nonattainment Areas
- (ii) General Requirement

Any owner or operator of any new or existing livestock confinement operations from which fugitive particulate emissions will be emitted shall be required to use all available practical methods which are technologically feasible and economically reasonable in order to minimize such emissions in accordance with the requirements of Section III.D. of this regulation.

(iii) Applicable Emission Limitation Guideline

Only the no off-property transport guideline shall apply to livestock confinement operations. Abatement and control plans submitted for livestock confinement operations shall be evaluated for compliance with the requirements of Section III.D. of this regulation.

(iv) Control Measures and Operating Procedures

Control measures or operating procedures to be employed may include, but are not limited to the use of sprinkler systems and/or other equivalent methods or techniques as approved by the Division.

IV. CONTINUOUS EMISSION MONITORING REQUIREMENTS FOR NEW OR EXISTING SOURCES

A. Sources which are required to install, calibrate, certify and maintain continuous emission monitoring (CEM) systems for opacity, and/or sulfur dioxide and/or carbon monoxide (listed in Sections B, C, and D, of this Section IV and in Section VII.) shall have such equipment installed in a location which in accord with sound engineering practice will provide for accurate opacity and/or sulfur dioxide, and/or carbon monoxide emission readings. The averaging times for these monitors shall correspond to the averaging times for the appropriate emission standard.

B. Fossil Fuel-fired Steam Generators

1. A continuous emission monitoring system for the measurement of opacity shall be installed, calibrated, maintained and operated by the owner or operator of any steam generator of a total rated capacity of or greater than 250 million BTU per hour heat input except where:
 - a. Gaseous fuel is the only fuel burned or,
 - b. Oil or a mixture of gas and oil are the only fuels burned and the source is able to comply with the applicable particulate matter and opacity regulation without utilization of particulate matter collection equipment,
 - c. The source demonstrates that a continuous monitoring system would not provide accurate determinations of the opacity of emissions (e.g., condensed, uncombined water vapor in the emissions would prevent

accurate readings) and an alternative method of determining opacity approved by the Division is employed.

2. Either a continuous emission monitoring system for the measurement of sulfur dioxide shall be installed, calibrated, maintained and operated or a Division approved sampling plan shall be developed and implemented for determining the amount of sulfur in the fuel in order to calculate sulfur oxide emissions on any fossil fuel fired steam generator of a total rated capacity of or greater than 250 million BTU per hour heat input.
3. If an owner or operator is required to install a continuous monitoring system for sulfur oxides, a continuous monitoring system for measuring either oxygen or carbon dioxide is also required.

C. Sulfuric Acid Plant

1. The owner or operator of each sulfuric acid plant of or greater than 300 tons per day production capacity (the production capacity being expressed as 100 percent acid) shall install, calibrate, maintain and operate a continuous emission monitoring system for the measurement of sulfur dioxide for each sulfuric acid producing unit within such plant.

D. Fluid Bed Catalytic Cracking Unit at Petroleum Refineries

1. The owner or operator of each catalyst regenerator for fluid bed catalytic cracking units of or greater than 20,000 barrels per day fresh feed capacity shall install, calibrate, maintain and operate a continuous emission monitoring system for the measurement of opacity.

2. The owner or operator of each fluid bed catalytic cracking unit of 5,000 barrels per day or greater fresh feed capacity, located in a carbon monoxide (CO) nonattainment area shall install, calibrate, maintain, and operate a continuous emission monitoring system for the measurement of carbon monoxide.
3. Exemptions:
 - a. The owner or operator of a fluid bed catalytic cracking unit described in IV.D.2. may apply to the Division for an exemption from continuous emission monitoring requirements listed in subsection IV.D.2. In order for an exemption to be granted, the following requirements must be met:
 - (i) The owner or operator of a source must conduct a flue gas emission test for carbon monoxide concentration. The test protocol must be approved at least 30 days in advance by the Division and emissions during the test must not exceed 250 ppm by volume on a one hour average; and
 - (ii) Source owners or operators must establish a consistent relationship between carbon monoxide flue gas concentration and indicator parameter(s) such as flue gas oxygen content, or flue gas temperature, through a Division approved test program; and
 - (iii) Source owners or operators must maintain records of CO indicator parameter(s), as described above, for a period of at least two years which shall be made available for Division review upon request.

D. Performance Specifications

The performance specifications used to determine the acceptability of monitoring equipment installed pursuant to Section IV.D.2. shall conform to those referenced in Appendix B of Part 60, Title 40, Code of Federal Regulations, or other specifications approved by the Division.

E. Calibration of Equipment

Owners or operators of all continuous monitoring systems subject to Section IV. of this regulation shall check the zero and span drift of the system at least once per day and at such other times as designated by the Division, according to procedures approved by the Division. The Division may also make such determinations in order to assure proper quality assurance.

F. Notification and Recordkeeping

The owner or operator of a facility required to install, maintain, and calibrate continuous monitoring equipment shall submit to the Division within 30 days following the end of each calendar quarter, a report of excess emissions for all pollutants monitored for that quarter. This report shall consist of the following information and/or other reporting requirements as specified by the Division.

1. The magnitude of excess emissions computed in accordance with Division guidelines, any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions.
2. The nature and cause of the excess emissions, if known.
3. The date and time identifying each period of equipment malfunction and the nature of the system repairs or adjustments, if any, made to correct the malfunction.
4. A schedule of the calibration and maintenance of the continuous monitoring system.
5. Compliance with the reporting requirements of this Section IV.G. shall not relieve the owner or operator of the reporting requirements of Section II.E. of the Common Provisions Regulation concerning upset conditions and breakdowns.

G. A file of all data collected relating to the preceding two- year period shall be maintained by the owner or operator of an affected source. The format in which the required information is submitted shall be determined by the Division.

H. The owner or operator of a facility utilizing fuel sampling as an alternative to continuous emission monitoring shall report fuel analysis data as specified in the sampling plan to the Division within 30 days following the end of each calendar half in a format prescribed by the Division. The purpose of such report shall be to disclose emissions that would exceed SO₂ emission standards.

V. EMISSION STANDARDS FOR EXISTING IRON AND STEEL PLANT OPERATIONS

A. Electric Arc Furnaces

1. Visible emissions from the gas-cleaning device or from uncaptured emissions escaping the Electric Arc Furnace shop, shall not exceed twenty percent (20%) opacity at any time. The approved reference test method for visible emissions measurement on which these standards are based is EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992)).
2. Emissions from the gas-cleaning device shall not exceed a mass emission rate of 0.00520 gr/dscf of filterable particulates maximum two-hour average, as measured by EPA Methods 1-4 and the front half of Method 5 (40 CFR 60.275, and Appendix A, Part 60), or by other credible method approved by the Division. This particulate emissions standard does not include condensable emissions, or the back-half emissions of Method 5.

B. Sources of particulate emissions at iron and steel plants not subject to specific emission limitations set forth in Section V shall comply with applicable emission limitations set forth elsewhere in this regulation.

1. Smoke Emissions and Opacity Requirements
[Cross-reference: Section II, subsections A.1., A.2 and A.6.i and A.6.iii]
2. Particulate Emission Requirements
[Cross-reference: Section III, subsection A.1, A.2, C.1 and C.3]

C. A statement of the basis and purpose for the revisions to this Section adopted March 11, 1982 is hereby incorporated by reference, and a copy of the statement is available from the Air Quality Control Commission office.

VI. SULFUR DIOXIDE EMISSION REGULATIONS

A. Sources constructed or modified prior to August 11, 1977 shall be considered an existing source. All existing sources of sulfur dioxide emissions, except for sources listed in Section VII, shall comply with the following:

1. Averaging time - Unless otherwise specified in other sections of this regulation, the averaging time for all sulfur dioxide emissions standards for sources which utilize a CEM shall be a three hour rolling average and the frequency of fuel sampling for sources which utilize a fuel sampling plan approved pursuant to Section IV.B.2. shall be as specified in such plan.

2. If the sum of sulfur dioxide emission rates for all sources located on a contiguous site is less than three tons per day potential uncontrolled SO₂ emissions, and if all federal and state ambient air quality standards are met no process based SO₂ emission standard shall apply.
3. Existing sources of sulfur dioxide shall not emit sulfur dioxide in excess of the following process-specific limitations. (Heat input rates shall be the manufacturer's guaranteed maximum heat input rates).
 - a. Coal-fired operations including coal-fired steam generation:

(These standards are also applicable to the use of coal-based by-product fuels.)

 - (i) Units with a heat input from coal or coal-based by-product fuels of less than 300 million BTU per hour:

1.8 pounds of sulfur dioxide per million BTU of heat input.
 - (ii) Units with a heat input from coal or coal-based by-product fuels equal to or greater than 300 million BTU per hour:

1.2 pounds of sulfur dioxide per million BTU of heat input.
 - b. Oil-fired Operations Including Oil-Fired Steam Generation
 - (i) Units with a heat input from oil of less than 300 million BTU per hour:

1.5 pounds of sulfur dioxide per million BTU of heating input.
 - (ii) Units with a heat input from oil equal to or greater than 300 million BTU per hour:

0.8 pounds of sulfur dioxide per million BTU of heating input.
 - c. Combustion Turbines
 - (i) Combustion Turbines with a heat input of less than 300 million BTU per hour:

1.2 pounds of sulfur dioxide per million BTU of heating input.

- (ii) Combustion Turbines with a heat input equal to or greater than 300 million BTU per hour:

0.8 pounds of sulfur dioxide per million BTU of heating input.

d. Natural Gas Desulfurization

Desulfurization Plants emitting more than five tons of sulfur dioxide per day:

2 pounds of sulfur dioxide per 1,000 cubic feet of (actual) delivered gas.

e. Petroleum Refining

0.7 pounds sulfur dioxide for the sum of all SO₂ emissions from a given Refinery, per barrel of oil processed, per day. This emission limit shall be calculated over each 24-hour period which commences at midnight. If the refinery does not operate for the entire 24-hour period, the actual hours of operation shall be used as the averaging time. At no time shall the averaging time be greater than 24 hours. Refineries in operation on or before August 1, 1995, which are covered by this regulation, shall submit a plan for Division approval no later than February 1, 1996. Sources constructed after August 1, 1995 shall submit a plan for Division approval along with construction permit applications. The plan shall define how compliance with this limitation will be demonstrated. This plan shall address both how the SO₂ value is calculated, i.e. mass balance, monitors, and how the barrels of oil processed value is derived, taking into account intermediate storage. The Division shall not limit the determination of barrels processed per day to a 24-hour period.

All data used to show compliance with this emission standard shall be maintained by the owner or operator of the affected source for a period of two years for sources that are not subject to the operating permit program, and five years for sources that are subject to the operating permit program. This data shall be available for inspection by the Division upon request.

f. Cement Manufacture

Seven pounds of sulfur dioxide per ton of material (including fuel) processed. This emission limit shall be calculated over each 24-hour period which commences at midnight. If the source does not operate for the entire 24-hour period, the actual hours of operation shall be used as the averaging time. At no time shall the averaging time be greater than 24 hours. New sources shall submit a plan for Division approval along with construction permit applications.

All data used to show compliance with this emission standard shall be maintained by the owner or operator of the affected source for a period of two years for sources not subject to the operating permit program and five years for sources subject to the operating permit program. This data shall be available for inspection by the Division upon request.

g. Sources Not Specifically Listed Above

Application of all available practical methods of control which are technologically feasible and economically reasonable. This is to be determined by the Division.

4. Recordkeeping and Reporting - All sources which have record keeping and reporting requirements shall comply with Sections IV.G. and IV.I of this regulation.
5. Data Retention - All sources which have recordkeeping and reporting requirements shall retain emission data for the proceeding two year period as referenced in Section IV.H. of this regulation.

B. All new sources of sulfur dioxide emissions shall comply with emission limitations as specifically provided by this subsection B.

1. For purposes of this Section VI.B. a new source is defined as a newly constructed or modified source of sulfur dioxide emissions which has not been issued an Emission Permit (in accord with Regulation No. 3 of this Commission) prior to the August 11, 1977 effective date of this amended regulation.
2. The averaging time for all new source emissions standards for sulfur dioxide shall be three hours, and any three-hour rolling average of emission rates which exceeds these standards is a violation of this regulation.
3. The term "modification" is as defined in the Common Provisions Regulation, Section I.G. except that any source of sulfur dioxide subject to an emission standard which measures the sum of all sulfur dioxide emissions from a given

facility shall not be considered "modified" for the purposes of this regulation unless the alteration may cause an increase in the sum of all sulfur dioxide emissions from such facility.

4. New sources of sulfur dioxide shall not emit or cause to be emitted sulfur dioxide in excess of the following process-specific limitations (Heat input rates shall be the manufacturer's guaranteed maximum heat input rates.)

a. All Coal-Fired Operations, Including Coal-Fired Steam Generators

- (i) Units converted from other fuels to coal:

1.2 lbs. SO₂/million BTU of coal heat input.

- (ii) Units with a coal heat input of less than 250 million BTU per hour:

1.2 lbs. SO₂/million BTU coal heat input.

- (iii) Units with a coal heat input of 250 million BTU per hour or greater:

0.4 lbs. SO₂/million BTU coal heat input.

b. All Oil-fired Operations, Including Oil-Fired Steam Generation.

- (i) Units with an oil heat input of less than 250 million BTU per hour:

0.8 pounds of sulfur dioxide per million BTU of oil heat input.

- (ii) Units with an oil heat input of 250 million BTU per hour or greater:

0.3 lbs. SO₂/million BTU of oil heat input.

c. Combustion Turbines

- (i) Combustion Turbines with a heat input of less than 250 million BTU per hour:

0.8 pounds of sulfur dioxide per million BTU of heat input.

- (ii) Combustion Turbines with heat input of 250 million BTU per hour or greater:

0.35 lbs. SO₂/million BTU of heat input.

d. Natural Gas Desulfurization

(As employed in this section, the term "delivered" means (a quantity of gas) delivered to the transmission pipeline).

- (i) Desulfurization Plants emitting less than three tons per day of SO₂:

2.0 lbs. SO₂/1000 cubic feet of (actual) delivered natural gas.

- (ii) Sources emitting three or more tons per day of SO₂:

0.8 lbs. SO₂/1000 cubic feet of (actual) delivered natural gas.

e. Petroleum Refining

0.7 lbs. sulfur dioxide, for the sum of all SO₂ emissions from a given refinery per barrel of oil processed, per day and 0.3 lbs. sulfur dioxide, for the sum of all SO₂ emissions from a given refinery per barrel of oil processed, per year. The daily emission limit shall be calculated over each 24-hour period which commences at midnight. If the refinery does not operate for the entire 24-hour period, the actual hours of operation shall be used as the averaging time. At no time shall the daily averaging time be greater than 24 hours. The yearly emission limit shall be calculated over each calendar year. If the refinery does not operate for the entire year, the actual days of operation shall be used as the averaging time. At no time shall the yearly averaging time be greater than 366 days. Sources constructed after August 1, 1995 shall submit a plan for Division approval along with construction permit applications. The plan shall define how compliance with this limitation will be demonstrated. This plan shall address both how the SO₂ value is calculated, i.e. mass balance, monitors, and how the barrels of oil processed value is derived, taking into account intermediate storage. The Division shall not limit the determination of barrels processed per day to a 24-hour period. All data used to show compliance with this emission standard shall be maintained by the owner or operator of the affected source for a

period of two years for sources that are not subject to the operating permit program and five years for sources subject to the operating permit program. This data shall be available for inspection by the Division upon request.

f. Production of Oil from Shale

Production of oil from shale shall be subject to the emission limitations provided in Colorado Air Quality Control Commission Regulation No. 6, Subpart B (Non-federal New Source Performance Standards (NSPS), Section IV.C.3.)

g. Refining of Oil Produced from Shale

(i) Refineries processing less than 1,000 barrels per day:
No process emission standard.

(ii) Refineries processing 1,000 or more barrels per day:

0.7 lbs. sulfur dioxide, for the sum of all SO₂ emissions from a given refinery per barrel of oil processed, per day and 0.3 lbs. sulfur dioxide, for the sum of all SO₂ emissions from a given refinery per barrel of oil processed, per year. This emission limit shall be calculated over each 24-hour period which commences at midnight. If the refinery does not operate for the entire 24-hour period, the actual hours of operation shall be used as the averaging time. At no time shall the averaging time be greater than 24 hours. Sources constructed after August 1, 1995 shall submit a plan for Division approval along with construction permit applications. The plan shall define how compliance with this limitation will be demonstrated. This plan shall address both how the SO₂ value is calculated, i.e. mass balance, monitors, and how the barrels of oil processed value is derived, taking into account intermediate storage. The Division Shall not limit the determination of barrels processed per day to a 24-hour period. All data used to show compliance with this emission standard shall be maintained by the owner or operator of the affected source for a period of two years for sources not subject to the operating permit program and five years for sources subject to the operating permit

program. This data shall be available for inspection by the Division upon request.

h. Sulfuric Acid Production

4.0 lbs sulfur dioxide/ton of acid produced and 0.15 lbs. H₂SO₄ mist/ton of acid produced.

5. (RESERVED)

6. Recordkeeping and Reporting - All sources which have recordkeeping and reporting requirements shall comply with Sections IV.G. and IV.I of this regulation.

7. Data Retention - All sources which have recordkeeping and reporting requirements shall retain emission data for the preceding two year period as referenced in Section IV.H. of this regulation.

8. A written statement of the basis and purpose of this new source emission control regulation, which includes a detailed analytical evaluation of the scientific and technical rationale justifying this regulation has been prepared and adopted by the Commission on August 11, 1977. This written statement entitled, "Rationale for the Promulgation of a New Source Emission Control Regulation and Ambient Air Quality Standards for Sulfur Dioxide", is hereby incorporated in this regulation by reference, in accord with C.R.S. 1973, 24-4-103 as amended.

C. Fuel Sampling

All fuel sampling plans must be approved by the Division. The appropriate ASTM test methods or other equivalent method approved by the Division shall be used for all fuel sampling plans

D. Performance Tests

Prior to granting of a final approval permit or amending a permit, when an emission source or control equipment is altered, or at any time when there is reason to believe that emission standards are being violated, the Division may require the owner or operator of any facility subject to the emission standards under Section VI to conduct performance tests, as measured by EPA Methods 1-4 Methods 6, 6a, 6b, 6c and Method 8 (40 CFR 60.275, Appendix A, Part 60), or any other method which the Division finds appropriate to determine compliance with this subsection of this regulation.

1. The owner or operator of an existing source of sulfur dioxide shall, upon request of the Division, conduct performance test(s) and furnish the Division a written report of the results of such performance test(s) to determine compliance with this regulation.
2. Performance test(s) shall be conducted and data reduced and recorded in accordance with the test methods and procedures specified above unless the Division:
 - a. Approves the use of an alternative method the results of which the Division has determined to be adequate for indicating whether a specific source is in compliance, or
 - b. Waives the requirement for performance test(s) because the owner or operator of a source has demonstrated by other means to the Division's satisfaction that the affected facility is in compliance with the standard. Nothing in this paragraph C. shall be construed to abrogate the Commission's or Division's authority to require testing under Article 7 of Title 25, Colorado Revised Statute 1973, and regulations of the Commission promulgated thereunder.
3. The owner or operator of an affected facility shall provide the Division thirty days prior notice of the performance test to afford the Division the opportunity to have an observer present.

E. Related Compounds Containing Sulfur in Oxidized States:

1. For the purposes of this regulation, all oxidized forms of sulfur (including, but not restricted to sulfur trioxide (SO_3), trionyl chloride (SOCl_2), and sulfuric acid mist (H_2SO_4)) shall be considered as sulfur dioxide.
2. Quantities of such oxidized sulfur compounds shall be converted on a molar basis to an equivalent quantity of sulfur dioxide. The total of all such

quantities, (expressed in parts per million by volume sulfur-dioxide-equivalents of other oxidized forms) shall be interpreted as "parts per million by volume sulfur dioxide" as used in Section B. above.

F. Alternative Compliance Procedures

1. Any person may apply to the Division Director for approval of an alternative:
 - a. Test method,
 - b. Method of control,
 - c. Compliance period,
 - d. Emission limit, or
 - e. Monitoring schedule.
2. The application shall include a demonstration that the proposed alternative produces:
 - a. An equal or greater air quality benefit than that required in this subsection VI, or
 - b. The alternative test method is equivalent to that required by these regulations.
3. The Division Director shall obtain concurrence from EPA prior to approving an alternative.

VII. EMISSION REGULATIONS FOR CERTAIN ELECTRIC GENERATING STATIONS OWNED AND OPERATED BY THE PUBLIC SERVICE COMPANY OF COLORADO

- A. The electric generating stations owned and operated by the Public Service Company of Colorado listed below shall not emit or cause to be emitted nitrogen oxides (NO_x) or sulfur dioxide (SO₂) in excess of the following limits. The emission rates for NO_x and SO₂ are measure in terms of pounds of pollutant per million British Thermal Units of fuel fired in the unit (lb/mmBTU).
1. Cherokee Electric Generating Station, 6198 North Franklin Street, Denver, CO
 - a. NO_x and SO₂ limits:

	NO _x (lb/mmBTU)	SO ₂ (lb/mmBTU)
Unit 1	-	1.1
Unit 2	-	1.1
Unit 3	0.60	1.1
Unit 4	0.45	1.1

- The NO_x limit will be calculated based on a 30-day rolling average, and is effective November 1, 1994.
- The SO₂ limit will be calculated as a three-hour rolling average, and is effective November 1, 1994.
- Public Service Company of Colorado shall install, certify and operate continuous emission monitoring equipment in accordance with 40 CFR Part 60.13, for measuring opacity, SO₂, NO_x, and either O₂ or CO₂ on Units 1, 2, 3 and 4.

b. Effective January 1, 2005, the NO_x limit for Unit 1 shall be 0.60 lb/mm BTU, provided EPA approves the designation of the Denver area as a PM-10 attainment/maintenance area. Such limit shall be calculated based on a 30-day rolling average.

c. Upon EPA approval of the designation of the Denver area as a PM-10 attainment/maintenance area, the SO₂ emission rate from units 1 and 4 shall not exceed 0.88 lb/mm BTU, calculated separately for each unit, based on a 30-day rolling average. Such emission limit shall apply seasonally from November 1 through March 1. The additional SO₂ limit set out in this subsection VII.A.1.c. shall not apply unless EPA repeals the incorporation of SO₂ permit limits into the SIP at 40 CFR 52.320(c)(82)(i)(E).

2. Arapahoe Electric Generating Station, 2601 South Platte River Drive, Denver, CO

a. Nox and SO₂ limits:

	NO _x (lb/mmBTU)	SO ₂ (lb/mmBTU)
Unit 1	-	1.1

	NO _x (lb/mmBTU)	SO ₂ (lb/mmBTU)
Unit 2	-	1.1
Unit 3	-	1.1
Unit 4	.60	1.1 +20% annual tonnage reduction

- The NO_x limit will be calculated based on a 30-day rolling average, and is effective November 1, 1994.
- The SO₂ limit will be calculated as a three-hour rolling average, and is effective January 1, 1995.
- The 20% SO₂ limit from Unit 4 shall be calculated on a calendar year, total annual tonnage basis. - Public Service Company of Colorado shall install, certify and operate continuous emission monitoring equipment in accordance with 40 CFR Part 60.13, for measuring opacity, SO₂, NO_x, and either O₂ or CO₂ on Units 1, 2, 3 and 4.

b. Upon EPA approval of the designation of the Denver area as a PM-10 attainment/maintenance area, the SO₂ emission rate from unit 4 shall not exceed 0.88 lb/mm BTU, calculated on a 30-day rolling average. Such emission limit shall apply seasonally from November 1 through March 1.

c. Retirement of units 1 and 2

i. Units 1 and 2 shall be permanently retired by January 1, 2003. This section VII.A.2.c. shall become effective upon EPA approval of the designation of the Denver area as a PM-10 attainment/maintenance area.

ii. This section VII.A.2.c shall not be construed to prevent the construction or operation of a new source on the site of such units, provided any such new source complies will all laws and regulations applicable to new sources.

3. Valmont Electric Generating Station, 1800 North 63rd Street, Boulder, CO

	NO _x (lb/mmBTU)	SO ₂ (lb/mmBTU)
Unit 5	0.45	1.1

- The NO_x limit will be calculated based on a 30-day rolling average, and is effective November 1, 1994.
- The SO₂ limit will be calculated as a three-hour rolling average, and is effective November 1, 1994.
- Public Service Company of Colorado shall install, certify and operate continuous emission monitoring equipment in accordance with 40 CFR Part 60.13, for measuring opacity, SO₂, NO_x, and either O₂ or CO₂ on Unit 5 .

VIII. RESTRICTIONS ON THE USE OF OIL AS A BACKUP FUEL

A. Applicability

The provisions of this section are applicable to all points at the following stationary sources in the Denver PM10 Attainment/Maintenance area that use oil as a backup fuel for natural gas, which is the primary process fuel:

1. Public Service Company of Colorado, Zuni Electric Generating Station;
2. Public Service Company of Colorado, Valmont Electric Generating Station;
3. Public Service Company of Colorado, Delgany Steam Generating Station;
4. University of Colorado Health Science Center (Fitzsimmons);
5. US Department of Energy, Rocky Flats Environmental Technology Site;
6. Gates Rubber Company; and
7. Trigen-Colorado Energy, Golden, CO.

B. Requirements

Beginning November 1, 1993, natural gas shall be the only fuel used from November 1 to March 1 of each year, except under the following circumstances:

1. The supplier of transporter or natural gas imposes a curtailment or an interruption of service;

2. For necessary testing of equipment used to operate the unit on oil, testing of fuel and training of personnel; or
3. When an equipment malfunction at the facility makes it impossible or unsafe for the unit to operate on natural gas.

C. Recordkeeping

Each stationary source subject to these provisions shall maintain records for a period of two years which include the following information:

1. dates and number of hours fuel oil is burned;
2. percent sulfur analysis of the fuel oil that is burned;
3. number of gallons burned each day; and
4. reason(s) for the use of the fuel oil.

D. Reporting

Beginning April 1, 1994 and by April 1 of each year thereafter, each stationary source subject to these provisions shall submit to the division a report containing the information listed in Section VIII.C.

E. Alternate Recordkeeping and Reporting

Where the information required under subsections C and D above is otherwise made available to the Division, for example in Air Pollution Emission Notice (APEN) reports submitted by the source or pursuant to operating permit requirements or analogous information is maintained by the source in a credible form approved by the Division, the requirements of subsections C and D of this Section VIII are satisfied.

IX. EMISSION REGULATIONS CONCERNING AREAS WHICH ARE NONATTAINMENT FOR CARBON MONOXIDE - REFINERY FLUID BED CATALYTIC CRACKING UNITS:

No later than nine months after the effective date of this revision (January 30, 1987) no source which has emitted 1,000 or more tons of carbon monoxide during any 12 month period, nor any source which can reasonably be expected to emit 1,000 or more tons of carbon monoxide during any future 12-month period, shall emit any gas in which carbon monoxide constitutes 0.050% (500 ppm) or more of the volume of the gas, based on a one hour average.

X. STATEMENTS OF BASIS AND PURPOSE

Sections I through IV and minor revisions to Section VI (Adopted April 8, 1982)

Regulation No. 1 sets forth emission limitations, equipment requirements, and work practices (abatement and control measures) intended to control the emissions of particulates, smokes and sulfur oxides from new and existing stationary sources. Control measures specified in this regulation are designed to limit emissions into the atmosphere and thereby minimize the ambient concentrations of particulates and sulfur oxides.

The regulation is primarily aimed at control of particulates of 10 micron size and smaller (i.e. "inhalable" particles). However, in recognition of the fact that larger particles - especially which may settle on roads, be ground into smaller sizes and later reintroduced into the atmosphere - larger size particles have also been controlled where control seemed appropriate.

Section II.A.1 - Smoke and Opacity.

The previous opacity regulations have made any exceedence of 20% opacity a violation. To conform to the method of opacity measurement used by the U.S. Environmental Protection Agency, the Commission has switched to the 6-minute averaging method of measuring opacity contained in EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992)). The testimony presented by Division representatives indicated investigators in the field have in effect been averaging opacity. The Commission encourages the Division to continue its practice of allowing non-agency personnel to attend smoke school and receive certification.

Section II.A.2 - Intermittent Sources.

The switch in methods of measuring opacity (see comments on Section II.A.1 above) made it necessary to devise a modified method to measure opacity from those sources which do not operate continuously for at least six minutes. EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992)) was amended to accommodate this situation.

Section II.A.3 - Pilot Plants and Experimental Operations.

The previous regulation excepted pilot plants and experimental operations from its 20% opacity standard to the extent of allowing emissions of up to 40% opacity for no more than 3 minutes in any 60 minute period (see previous Section II.A.2.b.). Because of the switch in methods of measuring opacity (i.e., now averaging for six minutes) this exception has been changed to now allow up to 30% opacity (as measured by EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992))) for no more than 6 minutes in any 60-minute period. This revised exception represents an equivalent relaxation. This relaxed opacity limitation applied only for 180 operating days, after which the 20% opacity limitation of Sections II.A.1 and 2 again applied. The regulation, however, provides that the Division may extend the maximum 180 - day period on good cause shown. For clarification, the phase "operating day" has now been defined and the exception made applicable to "process units" of a pilot plant or experimental operation to more accurately reflect the Commission's intent.

Section II.A.4 - Fire Building, Cleaning of Fire Boxes, Soot Blowing, Start-Up, Process Malfunction or Adjustments of Control Equipment.

On the same rationale that the limited exception for pilot plants was amended (see comments on II.A.3. above), the limited exceptions for these sources has also been changed from up to three minutes in a 60-minute period at no more than 40% opacity to up to six minutes at 30% opacity (averaged).

Section II.A.5 - Smokeless Flares.

Smokeless flares were not previously exempted in any way from the 20% opacity standard. The Commission has now allowed a limited exception of up to six minutes in a 60-minute period at 30% opacity (averaged) to reduce the burden of upset reporting on operations of smokeless flares.

Section II.A.6. - Alfalfa Dehydrating Plants.

This section remains the same as the previous Regulation No. 1 and requires compliance with 20% opacity by January 1, 1985.

Section II.A.7 - Wigwam Burners.

House Bill 1366 (1977) added Section 25-7-108(3)(e) to the Air Pollution Control Act of 1970. It provided: "that the provisions of any Commission Regulation concerning Wigwam Burners shall not apply prior to July 1, 1982, to any such burner located within seventy-five air miles of the border of any state bordering on Colorado if the regulations concerning wigwam wood waste burners of the bordering state are less stringent than those of the Commission. Said exemption shall not apply to wigwam wood waste burners located within a twenty mile radius of any city, town, or municipality having a population of fifty thousand persons as determined by the 1970 Federal Census." House Bill 1109 (1979) repealed the Air Pollution Control Act of 1970 including Section 25-7-108(3)(e). The Colorado Air Quality Control Act established by House Bill 1109 did not contain the above quoted exemption in

the new Section 25-7-109(3)(e) which gave the authority to adopt emission regulations for Wigwam wood waste burners to the Commission. The Commission has therefore promulgated emission standards for new and existing wigwam burners in this Regulation No. 1. New wigwam burners are subject to 20% opacity at all times. Effective January 1, 1983, existing wigwam burners are subject to a 40% opacity ceiling (i.e., no emissions in excess of 40% are allowed) except for 1 hour of start-up (ignition of a new fire after a period of nonoperation). Additionally, existing wigwam burners must submit a plan to control their emission by the same date. As was provided for in HB 1090 and HB 1109 (1979), the regulation recognizes exemption from state regulation for certain wigwam wood waste burners subject to county regulation.

Section II.A.8. - Exemptions.

As with the previous regulation, certain sources have been exempted from the opacity limitations in Sections II.A.1. and II.A.2. In some instances the exemptions are based on a determination that control of opacity is not economically reasonable or technically feasible (e.g., "fugitive dust" and noncommercial fireplaces burning clean wood); in others because the sources are subject to more appropriate emission limitations elsewhere in the regulation (e.g., iron and steel plants and "fugitive particulate emissions") the Commission realizes that woodburning in fireplaces, fireplace inserts and stoves may cause severe air pollution problems and has appointed a committee to evaluate the problems and plans, if necessary, to recommend changes to the regulation regarding smoke sources when adequate data is developed.

Definitions of "Fugitive Dust" and "Fugitive Particulate Emissions.

In connection with its decisions on exemptions from Section II.A.1. and II.A.2. and for the purposes of Regulation No. 1 only, the Commission has developed new definitions for "fugitive dust" (which is not subject to regulation) and "fugitive particulate emissions" (subject to the provisions of Section III.D.) to help distinguish between fugitive particulate pollution subjected to and exempted from regulation.

Section II.B. - Diesel Powered Locomotives.

This section has provisions for Diesel Powered Locomotives only and they are the same as the previous Regulation No. 1. Provisions for other motor vehicles have been deleted primarily because of the amendment of C.R.S. 1973, Section 18-13-110 in 1979. The previous restrictions on emissions from off-highway heavy duty diesel-powered vehicles was not carried forward to the current regulation because it was felt no significant reduction in emissions could be achieved in light of the exemption for such vehicles for nonconsecutive periods of 15 seconds (see former Section I.B.3.c-2).

Section II.C. - Open Burning.

This section was reorganized by the Commission and contains few substantive changes. The exemption for burning in municipalities with less than 3,500 population has been replaced with an exemption created by HB1090 (1979) for the unincorporated areas of counties with less than 25,000 population where the Board of County Commissioners has adopted regulations to control open burning. As was provided for in HB 1090 (1978), the regulation recognizes a limited exemption from state regulation for certain burning subject to county regulation.

Section III.A. - Fuel Burning Equipment.

This section has been reorganized and contains the same provisions as the previous Regulation No. 1 except that the performance test method has been changed from the American Society of Mechanical Engineer's Power Test Codes-PTC-27 dated 1957 entitled "Determining Dust Concentrations in A Gas Stream" to EPA Methods 1-4 and the front half of EPA Method 5 (40 C.F.R. 60.275, Appendix A, part 60). The change in test methods was made because of Division testimony that the latter method is the more widely used and recognized test procedure. Sources subject to Section V (iron and steel plants) of this Regulation No. 1 are exempt from this section.

Section III.B. - Incinerators.

This section was changed only with respect to the performance test method. The new methods to be used are EPA Methods 1-4 and the front half of EPA Method 5 (CFR. 60.275, Appendix A, Part 60). The change in test methods was made because of Division testimony that the latter method is the more widely used and recognized test procedure.

Section III.C. - Manufacturing Processes.

This section is a reorganization of the previous Regulation No. 1 and also contains provisions for existing alfalfa dehydration plants (also found in Air Quality Control Commission Regulation No. 5). Specific exemptions for Section V and for fugitive particulate emissions have been included in this section.

Section III.D.1 - (Fugitive Particulate Emissions) General Requirements.

In its 1981 opinion in CF&I Steel Corporation v. Colorado Air Pollution Control Commission (Case No. 77-804), the Colorado Court of Appeals expressed reservations about appropriateness of applying an opacity test to nonpoint sources, stating it saw "a significant number or problems" attributable to the fact the test was developed for application to stack or point sources. Although the court's reservations were expressed in dicta and the Commission has found that the opacity test can be applied to area sources (and the State Supreme Court has agreed to review the Court of Appeals decision), the Commission nonetheless realizes that opacity readings may be made on point sources more readily than on certain "area sources". Accordingly, the new regulation has shifted the use of opacity (and off property transport) observations from an enforceable standard for area sources to a guideline in determining when the adequacy of applied control methods should be reviewed.

The "general requirements" provisions of Section III.D. explain when control plans (or revisions to existing control plans) must be submitted and set forth the criteria for approvability of such plans. Under this new approach, enforcement action under C.R.S. 1973, 25-7-115 will be taken only when an owner or operator (a) fails to comply with the approved emission control plan for its source, (b) the source fails to submit a plan within the time prescribed for submittal, or (c) continues to operate after a control plan (or portion thereof) has been disapproved. A source will not, however, be deemed in violation if operation of such source is discontinued so as to permanently eliminate the cause of fugitive particulate emissions therefrom. Pursuant to C.R.S. 1973, 25-7-114(f) and 25-7-115(5), if a new source is denied a permit for failure to provide an adequate control plan or an existing source cited for operation in violation of the regulation, the owner/operator is afforded the opportunity to contest the Division's action before the Air Quality Hearings Board.

The lists of control and abatement measures contained in the regulation represent measures which are generally considered to be available, practical, economically reasonable and technically feasible. This determination is based on several factors, including the Division's observation that the same measures contained in the previous version of the regulation generally were both effective in controlling emissions of particulates and sulfur oxides and affordable. With few exceptions, (e.g., road carpeting), no new measures have been added to the list of suggested control and abatement measures beyond those which were listed in Section 2.D.9. of the previous Regulation No. 1.

To the extent cost data could be obtained from affected sources¹, or by the Commission, or its staff, a cost-benefit analysis was done for controls of fugitive particulate emissions on the basis of dollar cost of control per ton of emissions reduced. The Commission also considered, but did not quantify in dollars, other benefits to public health and welfare from controlling fugitive particulates such as aesthetics (e.g., elimination of visible plumes which obstruct views), elimination of "nuisance" conditions which frequently result in citizen complaints (e.g., dust from feedlots, construction activities and roadways), and possible adverse effects on certain industries - such as ski and tourist industries which benefit from clean air. The regulation requires employment of "all available practical methods which are

technologically feasible and economically reasonable." This requirement does not necessarily mean a source must employ all control measures and practices listed. For example, it obviously would not be economically reasonable to employ paving, road carpeting, dust suppressants and watering to control fugitive particulate emissions from unpaved roadways. Although the Commission has determined that the control and abatement measures listed in the regulation are generally economically reasonable for the types of sources to which they apply, it is recognized that in particular instances some of the listed measures ineffective, redundant or otherwise inappropriate. On the other hand, there may be control measures or practices not listed in the regulation for a type of source which are available, practical, technologically feasible and

By Order of August 7, 1981, the Commission ordered its staff and the parties to the rulemaking proceeding to conduct an "informal discovery process for the purpose, among others, of securing information on the cost to owners and operators of fugitive particulate emission sources of implementing the various control and abatement measures specified in the regulation. Discovery was to proceed in two phases of written inquiries and responses. The results of the process were disappointing. Some of the parties fully cooperated and submitted requested cost data including adequate information to substantiate the claimed costs. Despite receipt of written inquiries from Commission staff, requests made to parties during the hearings for additional information, and the Commission's follow-up letters to parties (dated November 6 and December 10, 1981) again requesting submittal of requested data; several parties failed to respond, others submitted unsubstantiated cost data, and others only partially responded. The Commission therefore, proceeded on the assumption that control and abatement measures which have been successfully employed in the past, continue to represent available, practical, economically reasonable and technologically feasible methods of control unless substantive evidence to the contrary was received.

The regulation therefore requires submission and evaluation of emission control plans on a source-by-source basis to allow the Division to evaluate the plan for each source in light of its particular circumstances. At such time, the owner or operator and the Division may determine that some of the listed measures are not appropriate as applied to a particular source or that others not listed are. This approach of a separate control plan for each source allows maximum flexibility in developing an enforceable control plan which represents an appropriate approach to control - in some instances more, in other instances less stringent than the listed controls. As control technology advances and other relevant circumstances change, it is expected that control methods meeting the requirements of Section III.D. will also change and that control plans previously approvable may have to be amended.

Sections III.D.1.c. and d. (Amended October 28, 1982)

Regulation No. 1, sections III.D.1.c. and d. were amended in response to the Attorney General's rule opinion of April 19, 1982 (disapproving, in part, section III.D. of Regulation No. 1 as adopted on April 8, 1982) and the objections of the Air Pollution Control Division of the Colorado Department of Health that the regulation did not allow it to require fugitive particulate emission control plans in all appropriate situations.

Evidence presented by the division at the hearing demonstrated that in many instances the emission limitation guidelines ("triggers") could be met by use of emission controls significantly less stringent than "all available practical methods of control which are technologically feasible and economically reasonable" (hereafter "all practical controls"). The attorney general's primary concern was that virtually identical sources could therefore be subjected to these differing "standards" -- i.e., one required to apply "all practical controls"; the other only having to avoid exceeding a less stringent trigger with the division being unable to require a control plan.

The Division also testified that, in some instances, the 20% opacity and no-off-property-transport guidelines would be inadequate because use of those triggers to require submission of a control plan required an observation be made at the time the particulates were being emitted and also that the observations be made under specific circumstances. The Division would therefore be unable to require a control plan, even though one may be appropriate, if an inspector did not actually observe the exceedence of the guideline or if all requirements for making the observation were not present (e.g., the winds exceeded 30 mph).

First of all the regulation does not necessarily require that a Division inspector personally observes emissions exceeding one of the triggers. The Division may require a control plan provided there is adequate, reliable evidence that a trigger has been exceeded.

The revisions to the regulation further address the problems the Division has raised. The nuisance trigger (which was previously applicable only to unpaved roads and haul roads) has been made applicable to all regulated sources. This will allow the Division to require a control plan from a source creating a nuisance even when an inspector is unable to use the 20% opacity or no off-property transport guideline (e.g., because of high winds).

The language adopted is literally less comprehensive than that proposed in the rulemaking notice. The revised regulation, however, (a) at a minimum addresses those sources of fugitive particulate emissions where the need for specific control plans is clearest and (b) provides more concrete (less vague) guidance to persons subject to the regulation of what level of control is required absent a specific control plan. The Commission expects that this will facilitate voluntary compliance by sources without plans.

Although theoretically situations could still arise whereby similar sources are subjected to different standards, it is the determination of the Commission that in practice, as revised, the regulation with its now broader nuisance trigger will subject virtually all significant sources of fugitive particulate emissions to the requirement of applying "all practical controls". In the event the regulation fails to achieve this intended objective, the regulation will be viewed as a "first step" towards its achievement and further revisions will be made.

Nothing in the regulation is intended as, nor should it be construed as, prohibiting the Division from conducting inspections as required by C.R.S. 1973, 25-7-115 -- whether on an annual or other periodic basis, in response to complaints, or otherwise.

Section III.D.2.a. - Roadways.

This section provides a list of appropriate control measures for controlling dust from unpaved roadways. The Commission initially had to determine which unpaved roadways warranted control based on the amount of fugitive particulate emissions resulting from their use. The amount of 25 tons per year (TPY) per mile was chosen as an appropriate figure based on the fact that 25 TPY is the figure in Commission Regulation No. 3 deemed "significant" for the purpose of triggering the special nonattainment area permit requirements (e.g., offsets, LAER) for major modifications. Regulation No. 3, Section IV.D.2.b.(v). (Emissions of 25 TPY or more is also one of the triggering factors that would require a new emission permit application be subjected to public comment. Regulation No. 3, Section IV.C.1.) Using 25 TPY (per mile) as the point at which an unpaved road should be required to control emissions, it was calculated using representative figures for the other factors that unpaved roads with traffic counts of 150 vehicles in nonattainment areas and 200 vehicles in attainment areas would cause emissions requiring control.

The Commission included the traffic count of 150 vehicles per day (averaged over any consecutive 3-day period) for unpaved roadways in nonattainment areas as a result of the calculated emissions from an average weight passenger car (2800 lbs.), traveling at a speed of 30 miles per hour, over a one mile stretch of unpaved road and with the assumption of 30% of those emissions remaining suspended. Using the following equations:

$$EF = 5.9 \left(\frac{S}{12} \right) \left(\frac{V}{30} \right) \left(\frac{W}{3} \right)^{0.8} \left(\frac{d}{365} \right)$$

$$EMISSIONS = \frac{.3(EF) \times (Y) \times 365 \text{ days/yr}}{2000 \text{ lbs./ton}} = 25 \text{ tons/yr.}$$

S = silt content

V = vehicle speed

W = weight of vehicle

d = dry days per year

EF = emission factor expressed in terms of lbs. per vehicle miles traveled

Y = Vehicle miles traveled per day

The higher traffic count in attainment areas can be accounted for by examining the difference in the factor "number of dry days per year" between attainment and nonattainment areas (215 and 285 respectively). (Because the nonattainment areas are basically all east of the mountains "dry day" figures for Colorado eastern plains were used for nonattainment areas; and north-central mountain figures were used for attainment areas.)

In response to the Colorado Court of Appeals' decision in CF&I Steel Corporation vs. AQCC (cited above), the regulation no longer has separate sections concerning publicly-owned and privately-owned unpaved roadways. The provisions for control of emissions from unpaved roadways apply to all unpaved roadways and reference to ownership has been eliminated.

There was discussion at the rulemaking hearing about whether dust emissions from unpaved roadways were inhalable and therefore presented a hazard to public health. It is the Commission's conclusion that 65% of the emissions [expressed as a percentage of suspended particulate (i.e. less than 30 microns)] from unpaved roadways are less than 10 microns in size and less (improved emission factors for fugitive dust from western surface coal mining sources Vol. II) and that they therefore do warrant control for the protection of public health.

Various persons, including local governments and the Colorado General Assembly, expressed concern about the cost of controlling emissions from unpaved roadways and urged that local officials are generally in a better position to determine and exercise appropriate control over roadways. Especially in light of the limited personnel resources of the Division, the Commission would therefore encourage the Division to exercise its authority under C.R.S. 1973, Section 25-7-111(2)(f) in designating local agencies willing and able to enforce the regulation as agents of the Division in concurrently enforcing this regulation - and especially with respect to air pollution problems which can be evaluated by such local agencies.

Neither the 20% opacity nor the no off-property transport emission limitations guidelines seemed appropriate for application to unpaved roadways. To focus the limited personnel resources on the more serious problems a "nuisance" emission limitation guideline has been employed. Investigations will be initiated in response to citizen's complaints of nuisances created by excess emissions from unpaved roadways.

Section III.D.2.b. - Construction Activities.

Large percentages (54% from dozers, 49% from scrapers, 48% from graders, 67% from exposed areas) of the fugitive particulate emissions from construction activities are inhalable (Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources, Vol. II) and therefore need controls. Thus the Commission has established a list of potential control measures for this activity. The smallest size of disturbed acreage requiring control in nonattainment areas was reduced from 5 acres to 1 acre in size in order that those smaller sources - determined to be significant source of emissions in nonattainment areas because of the great amount of construction activities occurring on smaller sites - could be controlled. The 5 acres remains as the size cutoff in attainment areas.

Section III D.2.c. - Storage and Handling of Materials.

The Commission established a list of potential control measures for this activity for inclusion in a requested control plan. The percentage of inhalable particulates from storage and handling activities is presented in Improved Emission Factors for Fugitive Dust from Western Coal Mining Sources, Vol. II (listed as 30% loading, 49% dozer, 61% storage piles) are significant emissions and therefore the Commission has concluded that such emissions should be controlled.

Section III.D.2.d. - Mining Activities.

A large percentage of fugitive particulate emissions from mining activities are inhalable. The information in Table 12-2 from Improved Emission Factors for Fugitive Dust from Western Coal Mining Sources, Vol. II, shows inhalable particulates for several mining related activities in a range of 30% - 67%. The Commission has concluded that these are significant emissions and should therefore be controlled. Thus the Commission has established the list of potential control measures for this activity for inclusion in a control plan. Underground mining activities are exempt from the provisions of Section III.D.2.d. However, if emissions from underground mining activities are vented to the atmosphere, they are subject to the opacity provisions of Section II.A.1.

Section III.D.2.e - Haul Roads.

The Commission determined that a substantial amount of fugitive particulate emissions come from haul roads. For example, the percentage of inhalable particulates created by haul trucks traveling on such roads is listed as 52% in a table from Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources Vol., II. The Commission has concluded that these emissions are significant and should be controlled. Thus, the Commission established the list of potential control measures for this activity. The Commission included a traffic count of 40 haul vehicles or 200 total vehicles per day (averaged over any consecutive 3-day period) for haul roads as a result of the calculated emissions using the following formula:

$$EF = \frac{SV}{60} \frac{365-W}{365} \frac{N}{4}$$

s = silt content (if unknown assume 15%)

v = vehicle speed in mph (average)

w = mean annual number of days with .01 inches or more rainfall

n = number of wheels on vehicle

Assumptions:

40 mph (average speed) = v

6 wheels on vehicles = n

80 days (West Slope condition) = w

$$EF = \frac{15 \times 40}{60} \frac{365 - 80}{365} \frac{6}{4} = 11.7 \text{ lb/VM T}$$

$$\text{Emissions} = \frac{.3 (EF) \times "Y" \times 365 \text{ Days /Yr}}{2000 \text{ lb Per Ton}} = 25 \text{ Tons/Year}$$

$$E = \frac{25 \times 2000}{.3(11.7)(365)} = 40 \text{ vehicle miles per day}$$

EF = Emission factor expressed in terms of lbs.
Per vehicle mile traveled

"Y" = Vehicle miles traveled per day

Recognizing that a haul road could have significant emissions even without hauling 40 haul vehicles per day because of other vehicular traffic, haul roads are subject to the regulation when their traffic count exceeds either 40 haul vehicles or 200 total vehicles per day (200 light weight vehicles representing emissions of 25 tons per year for unpaved roadways - see comments on Section III.D.2.a. above.)

As with roadways and for the same reasons, a nuisance emission limitation guideline has been adopted as an inspection "trigger" for "off-site" haul roads. The no off-property transport emission limitation guideline applies to "on-site" haul roads.

Section III.D.2.f. - Haul Trucks.

A list of alternative control measures has been established by the Commission for this activity for inclusion in a requested control plan. There were no emission factors for determining the emissions from the load of a loaded haul truck.

Section III.D.2.g. - Tailings Piles and Ponds.

The Commission established the list of abatement and control measures for this activity for inclusion in any requested control plan. "exposed areas" are listed in a table as being 67% inhalable particulates. This is found in Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources, Vol., II. The Commission concluded that these emissions are significant and therefore should be controlled.

Section III.D.2.h - Demolition Activities.

A significant amount of this activity does occur in the nonattainment areas and necessitates control. The Commission established the list of control measures for this activity for inclusion in a control plan submittal. Cross-reference is made to the requirements of Regulation No. 8 regarding asbestos materials.

Section III.D.2.i - Blasting Activities.

The Commission provided a list of potential control measures for inclusion in any requested control plan. The percentage of inhalable particulates from blasting is listed as 44% in a table from Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources, Vol. II. The Commission concluded that these emissions are significant and should therefore be controlled.

Section III.D.2.j - Sandblasting Operations.

The Commission established a list of potential control measures for inclusion in any requested control plan.

Section III.D.2.k - Livestock Confinement Operations.

The Commission established a list of potential control measures for inclusion in any requested control plan. These measures will provide an economic benefit to the operator of livestock confinement operations (i.e., there should be fewer incidents of dust pneumonia in livestock).

Agriculture Activities: The Commission determined that fugitive particulate emissions from agricultural activities (e.g., plowing, or dicing) cannot be controlled by methods which are economically reasonable and feasible - such as watering. The Commission further

determined that the great majority of emissions from agricultural activities was not from activities such as plowing, but from the action of the wind on exposed soil. The Commission therefore reviewed the provisions of the Colorado Soil Erosion and Dust Blowing Act of 1954, C.R.S. 1973, Section 35-72-101, and determined that statute adequately addresses the problem of fugitive particulate emissions from agricultural activities. Agricultural activities are therefore not subject to the provisions of Section III.D. Agricultural activities have been specifically exempted from the open burning requirements of Section II.C. The exemption is viewed as an economic necessity to commercial agricultural operations.

Section IV. - Continuous Emission Monitoring Requirements for Existing Sources.

The Commission has included Continuous Emission Monitoring Requirements for four types of sources: Fossil Fuel-Fired Steam Generators; Sulfuric Acid Plants; Fluid Bed Catalyst Regenerators at Petroleum Refineries. However, CEM units for the measurement of NO_x emissions from existing sources of NO_x were considered unnecessary as there is no NO_x standard for existing sources. As a substitute to CEM an approved coal sampling program to determine the sulfur content of the coal being fired in the steam generators may be employed. With such data, SO₂ emissions can be calculated. Performance specifications, calibration requirements, notification and recordkeeping have been included for the evaluation of any such CEM system which is required by this section. This part meets and exceeds the requirements of 40 CFR, Part 51, Appendix P, Volume 40, No. 194 Fed. Reg. 46247 (October 6, 1975).

The Commission has determined that continuous emission monitoring for carbon monoxide (CO) is necessary for fluidized-bed catalytic cracking unit regenerators at petroleum refineries. Continuous Emission Monitoring will ensure the emission standard is being met at these sources which are the largest CO emitters in the state. (March 20, 1986)

Section V. - (Adopted March 11, 1982) See below.

Section VI. - Sulfur Dioxide Emission Regulations:

The Commission made no substantive changes to the provisions of the previous Regulation No. 1.

The Commission revised the regulation to make existing sources subject to meeting specific emission standards when their emissions exceed three tons per day of sulfur dioxide rather than the previous five tons per day. The new level is to ensure that major sources of sulfur dioxide in Colorado are well controlled such that ambient impacts and potential air quality related value impacts are reduced. (March 20, 1986)

Section IX. Emission Regulations Concerning Areas which are Nonattainment for Carbon Monoxide.

Carbon Monoxide Emission Regulation: The Denver Metro Area has a serious Carbon Monoxide Air Pollution Problem. Air quality monitoring conducted in 1980 indicated that the Denver Metro Area exceeded the standard by almost 58% (for the second worst case). Air quality modeling performed in support of the 1982 State Implementation Plan (SIP) shows that the predicted maximum concentration of CO in 1987 will still exceed the national Air Quality Standard by 25%. If Denver does not come into compliance by 1987 it faces possible economic sanctions or imposed measures which will decrease carbon monoxide levels sufficiently so that the standard will be met.

EPA reviewed Colorado's 1982 SIP submittal and expressed concern regarding the CO problem and the Division's plans to deal with it. One strategy EPA has stated Colorado must employ is the requirement that all major stationary sources of CO (greater than 1,000 TPY) in nonattainment areas use "Reasonably Available Control Technology" (RACT) to reduce emissions. Though EPA has not specifically defined what RACT is for major CO sources, the Commission herein defines RACT as any control device approved by the Division that will reduce CO emissions to a level less than or equal to 0.050% of exhaust gases by volume.

The only CO sources located in nonattainment areas of Colorado which emit greater than 1,000 TPY are fluidized-bed catalytic cracking units (FCC) at Petroleum refineries. Uncontrolled emissions from these units can approach 10% (100,000 ppm).

Control technology is readily available for use in FCC units. According to EPA publication AP-42, carbon monoxide boilers can reduce emissions to "negligible levels". Similarly, the use of combustion promoters can reduce CO emissions to less than 0.050%, according to the Encyclopedia of Chemical Technology.

The requirement to apply RACT to carbon monoxide emission sources at refineries will reduce reported emissions, as used in the 1982 SIP Revision, from 125 tons per day to 11 tons per day, an improvement of about 91%. This will result in a 4% reduction in the Denver Metro CO inventory, thus demonstrating further progress towards attainment of the National Ambient Air Quality Standards. (March 20, 1986)

APPENDIX A Method of Measuring Opacity from Fugitive Particulate Emission Sources.

Also in response to the referenced dicta in the Court of Appeal's CF&I decision, the Commission has included a specified method for measuring opacity of fugitive particulate emissions from nonpoint sources. Although this may not be as precise as Method 9 (40 CFR, Part 60, Appendix A (July, 1992)) as applied to stacks since this is a guideline and not an enforceable standard the Commission determined it to be quite adequate for these purposes. The method is a modified version of EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992)). Terminology was changed to reflect this method's applicability to fugitive particulate emission sources covered by Section III.D.A. of this regulation. Additional procedures are established for the positioning of the observer and the observing of emissions

(at a point of release to the atmosphere). These procedures will become part of the training at "smoke schools" conducted by the Colorado Department of Health for certification of smoke and opacity observers.

APPENDIX B. Method of Measurement of Off-Property Transport of Fugitive Particulate Emissions.

The Commission included this method of measurement of fugitive particulate emissions in order that the "Off-Property Transport" guideline be uniformly applied by observers. This method generally employs the same criteria for the positioning of an observer as the method of measurement of opacity in Section III.D.2. of this Regulation No. 1. This method will also be included in the "smoke school" training for the certification of smoke and opacity observers.

a. Section V. (Adopted March 11, 1982)

This rationale complies with the requirement of the Administrative Procedure Act, C.R.S. 1973, 24-4-103(4) that the Air Quality Control Commission (Commission) prepare a statement of basis and purpose for these amendments. The statutory authority for these amendments are in the Air Quality Control Act at C.R.S. 1973, 25-7-102, 25-7-105, 25-7-106, and 25-7-109. The general purpose of the amendments was to require reasonably available control technology (RACT) be applied to particulate emission sources at existing iron and steel plants. The CF&I Steel Corporation (CF&I) and the U.S. Environmental Protection Agency (EPA) were the only parties to the rulemaking. The Air Pollution Control Division (Division) acted as staff for and advised the Commission during the proceeding.

The parties and the Commission addressed two major areas of controversy: whether the use of clean water for coke quenching operations represents RACT and which methods of emission control for cast houses represents RACT.

Coke quenching is considered by the Commission to be a major source of particulate emissions from iron and steel plants and development of emission controls for coke quenching should be encouraged. As originally proposed, RACT for coke quenching would have required the use of water having no more than 700 mg/l of total dissolved solids (TDS). However, upon review of the rulemaking record, the Commission has determined that it has insufficient information to adopt an emission control regulation for coke quenching. Therefore, the Commission is requiring the submission of reports on the capabilities of wastewater treatment facilities, the generation rates of wastewater, the relationship between TDS levels in coke quench water and other variables, the particulate-removing efficiency of existing baffling systems, and the costs of installation of alternative baffling systems. Based on these reports and information relating to the effectiveness of powder activated carbon in wastewater treatment facilities, the effectiveness of baffling systems at other iron and steel plants, the relationship of TDS levels to

particulate emissions, and other relevant information, the Commission will reconsider the issue of RACT for coke quenching.

The Commission has determined that non-capture technology (for example, shrouding and suppression) constitutes RACT for cast house particulate emissions, except for emissions from the iron notch, ladle and spouts. Due to the developing and proprietary nature of such technology, the Commission has adopted a general requirement for use of such technology which will permit iron and steel plants to determine its most cost and pollution control effective application at such plants. Iron and steel plants will be allowed a period of two years to develop, evaluate and apply a non-capture technology at one of its cast houses. It is not considered feasible to apply such technology in a lesser time period. Based on the experience with this initial application, the Commission expects to develop a more specific standard for the use of such technology at additional cast houses. Because there is not a basis in the record for concluding that capture technology is cost effective or RACT, the Commission has determined not to require such technology.

b. Amended Sections V.A.5.c. and V.B.5.a. (Adopted: February 24, 1983).

This rationale complies with the requirement of the Administrative Procedure Act, C.R.S. 1973, 24-4-103(4) that the Air Quality Control Commission (Commission) prepare a statement of basis and purpose for these amendments. The statutory authority for these amendments are in the Air Quality Control Act at C.R.S. 1973, 25-7-102, 25-7-105, 25-7-106, and 25-7-109.

The Commission has determined that the effective dates for meeting the requirements for coke quenching and cast houses as described above in paragraph B should be postponed for the following reasons:

- (1) Due to economic conditions the coke plant and blast furnaces at the iron and steel plants are currently not in operation. The studies and control measures outlined in Section V were to be conducted and implemented while those sources were in operation (with the exception of a study outlining the costs of installing and operating existing quench towers with alternative baffling system(s)).
- (2) With regard to the study outlining the costs of installing and operating existing quench towers with alternative baffling systems, the Commission determined that (due to the current economic conditions and reduced work force at iron and steel plants) a postponement until "normal rate of production" at coke plants is again reached would result in more useful data being submitted.

In regard to quenching of coke the time period for submittal of reports shall be fifteen months from the time that production levels return to 128 ovens per day. With regard to

cast houses, the time period for implementing controls shall be determined from the date of return to service of one blast furnace.

Regarding the issue of reasonably available control technology ("RACT"), for the iron notch, the iron ladle and the iron spout required to be addressed by Section V.B.5., the Commission adopts the Division's and CF&I's agreement that RACT is not currently available in non-capture emission controls for the iron spout and the iron ladle. However, there is reason to believe that U.S. Steel Corporation will soon be publicly revealing its non-capture technology for iron and steel plants. The Division should review the available technology, and if RACT exists, return to the Commission with a recommendation for rulemaking.

For these reasons, the Commission believes that emissions from iron and steel plants will be controlled as expeditiously as practicable under these delayed schedules.

- c. Written statements of the basis and purpose for the various provisions in Section VI of this regulation were prepared and adopted by the Commission at the times such provisions were adopted. These written statements were incorporated in this regulation by reference and in accord with C.R.S. 1973, 24-4-103 as amended. Copies are available at the office of the Air Quality Control Commission.

RATIONALE FOR THE PROMULGATION OF A NEW SOURCE EMISSION CONTROL REGULATION

The Air Pollution Control Commission of the State of Colorado has reviewed the oral testimony and documentary evidence submitted in the course of its rulemaking proceedings on proposed new ambient air standards for sulfur dioxide and new source emission standards for sulfur dioxide. The attached amendments to the existing Colorado ambient air quality standards for sulfur dioxide and the existing Regulation No. 1 of the Colorado Air Pollution Control Commission are a result of study, analysis and technical evaluation by the Commission and its staff and, in the judgment of the Commission, represent those standards which will most effectively foster the welfare, convenience and comfort of Colorado residents in facilitating the enjoyment of nature, scenery, and other related resources of the State. In every respect, this Commission's deliberations and determinations have been guided by the legislative declaration of the policy of the Colorado Air Pollution Control Act of 1970: to achieve the maximum practical degree of air purity in every portion of our State.

New Source Emission Standards for Sulfur Dioxide

It was evident through out the course of public hearings and is obvious to the Commission that the hazardous effects of sulfur dioxide are measured by its concentration in the ambient air. It is the quantity emitted per unit time that determines this ambient concentration rather than the concentration in any particular effluent stream. Emission rates are significant with respect to effects on the environment and on human population and vegetation, but ambient air concentrations are the primary consideration in terms of these effects and for that reason ambient air standards which are reasonably related to existing conditions in Colorado have been established. These new ambient standards and emission rates have been developed to reflect a consistent basis.

Three general themes have been considered by the Commission in the course of establishing these new sulfur dioxide standards. (1) Best practical control technology must, in general, be employed. (2) For some industries the cost of such control technology might be prohibitive for certain small sources. Since the total emissions from such sources are not large and do not have a substantial effect on ambient concentrations, the Commission has adopted emission standards which reflect economic considerations for small sources. (3) In response to overwhelming testimony from industry, from technical experts, and from the general public, the Commission has acknowledged that emission standards should not be based on volumetric concentrations in the effluent stream but rather on the weight of sulfur dioxide emitted per energy input or unit of product as processed.

Many witnesses representing industry and users of electrical power suggested that Colorado should adopt the EPA New Source Performance Standards (NSPS). This suggestion has been considered by the Commission. However, it is the conclusion of the Commission that EPA New Source Performance Standards are based on the use of high-sulfur coal as well as the application of best external control technology to the effluent gases. Given the availability of low-sulfur western coal for industrial usage in this state, it has been concluded that the application of best practical control technology should result in considerably lower emissions for Colorado sources than those specified in EPA New Source Performance Standards. Logically, the more stringent emissions standards are possible and desirable if low sulfur coal is employed. Testimony to support this conclusion was presented at the hearings.

The Commission has adopted certain features of the New Source Performance Standards: (1) The Commission has established a two-hour averaging time for emission standards identical to that set forth in the NSPS. (2) The Commission has recognized that small sources should not be subject to the substantial cost of external sulfur dioxide removal equipment, which is proportionately more costly for small industrial operations. The hazard to ambient air quality may be satisfactorily minimized in most instances by the use of low-sulfur fuels for these smaller sources. Where a distinction is made, the cut-off point for small sources is identical to that employed in the NSPS (250 million BTU per hour).

Coal-Fired Operations Including Coal-Fired Steam Generation

Take as a reference point the information supplied in the application for an emission permit for the proposed Pawnee 500 megawatt steam generating station. A heat input of 5,430 Million BTU per hour produce 500 megawatts of electrical power. The overall thermal efficiency is 31% and 10.9 million BTU per hour are required per megawatt of power.

Some eastern high-sulfur coals have caloric values on the order of 12,000 BTU per pound and sulfur contents on the order of 2.5%. If it is assumed that 5% of the sulfur is retained in the ash, the emission rate of an operation using this coal would be 3.96 pounds of sulfur dioxide per million BTU. Compliance with the New Source Performance Standards of 1.2 pounds per million BTU would require a sulfur dioxide removal efficiency of 70%. It is the finding of this Commission, based in part upon testimony from industrial and non-industrial sources, that control efficiencies on the order of 70% sulfur dioxide removal may be attained without undue financial burden on large new sources. This 70% removal efficiency may be taken as a measure of the application of best practical control technology. Testimony presented before the Commission indicated that steam coal readily available for use in Colorado had a caloric content on the order of 8,000 BTU per pound and a sulfur content of 0.5%. Uncontrolled emissions from the use of such coal would be 1.19 pounds of sulfur dioxide per million BTU. The best practical control technology, operating at an efficiency of 70% would reduce the emission rate to 0.36 pounds of sulfur dioxide per million BTU. The Commission, therefore, adopted an emission standard of 0.4 pounds of sulfur dioxide per million BTU. The required removal efficiencies are shown as a function of coal parameters in Table I.

For smaller sources an emission limit was set identical to the NSPS large source values. This standard may be met by the use of high quality low-sulfur western coal. The maximum emission under this standard would be 3.6 tons of sulfur dioxide per day and could result in the production of 23 megawatts of electrical power. Table II contains some information regarding the quality of coal required to meet this standard.

Of special concern to the Commission was the problem of conversion of facilities from other fuels to coal. This issue was frequently raised in the testimony. It was clearly indicated that the cost of installing external sulfur dioxide control equipment would be prohibitive in terms of the necessary modifications to existing equipment: lack of space in which to install the control equipment was termed an almost insurmountable obstacle. The Commission therefore concluded that the sulfur dioxide emissions standard for operations converted to coal-firing from the use of other fuels would be the NSPS; namely, 1.2 pounds of sulfur dioxide per million BTU. This standard can be met through the use of available high quality coal. The maximum emission from such a converted 100 megawatt facility would be approximately 16 tons per day, or equivalent to the emissions from a 300 megawatt installation operating at an emission rate of 0.4 pounds of sulfur dioxide per million BTU. The nature of the required coal quality is indicated in Table II.

TABLE I
REMOVAL EFFICIENCIES REQUIRED TO MEET AN
EMISSION STANDARD OF 0.4 POUNDS PER MILLION BTU
(Assumes 5% sulfur retention in ash)

Caloric Content Efficiency (%) (BTU/lb.)	Percent Sulfur	Removal
8,000	0.4	58
	0.5	66
	0.6	72
	0.8	79
	0.9	81
9,000	0.5	62
	0.6	69
	0.8	76
	1.0	81
10,000	0.6	65
	0.7	70
	0.9	77
	1.1	81
11,000	0.6	62
	0.7	67
	0.9	74
	1.1	79

TABLE II
SULFUR DIOXIDE EMISSION
FROM COAL
(Assumes 5% sulfur retention in coal)

BTU/pound	Maximum Sulfur Content to Meet Emission Standard of 1.2 pounds per million BTU
8,000	0.50%
9,000	0.57%
10,000	0.63%
11,000	0.69%

Under certain circumstances the emission standards may be limiting; under other circumstances, the ambient air quality standards may govern the issuance of permits to new coal-fired sources. In any event, impact on ambient air quality is the ultimate concern and siting may thus become an important factor for new sources. Several Rocky Mountain States have adopted sulfur dioxide emission standards more restrictive than the Federal standards and in some cases, more restrictive than these Colorado Standards.

Oil-Fired Operations Including Oil-Fired Steam Generation

The New Source Performance Standards (NSPS) for oil-fired operations with a heat input greater than 250 million BTU per hour is 0.8 pounds of sulfur dioxide per million BTU. In line with the philosophy of higher emission rates per unit of energy input for small sources and in line with the adoption of NSPS for new coal-fired sources of less than 250 million BTU input per hour, the Commission adopted an emission standard of 0.8 pounds of sulfur dioxide per million BTU for sources with a heat input less than 250 million BTU per hour. The required degree of oil quality is shown in Table III, and oil of the quality necessary to meet these standards is available.

For larger oil-fired operations (greater than 250 million BTU per hour) the Commission again decided to require best practical control technology. The standard adopted is calculated from the ration of the NSPS standards for coal and oil applied to the adopted 0.4 pounds per million BTU standard for coal-fired operations. The standard for large new oil-fired operations thus becomes 0.3 pounds of sulfur dioxide per million BTU. At present, there is little expectation that large new oil-fired facilities will be constructed. No industry provided testimony at the hearings regarding its intent to construct a large oil-fired facility in Colorado.

TABLE III
SULFUR DIOXIDE EMISSIONS FROM
FUEL OIL

Percent sulfur	Pounds per million BTU
0.1	0.11
0.2	0.21
<u>0.28*</u>	<u>0.30</u>
0.4	0.42
0.6	0.42
0.7	0.75
<u>0.75**</u>	<u>0.80</u>
0.9	0.95
1.0	1.05

* Maximum sulfur content required to meet standard of 0.3 lbs/million BTU

** Maximum sulfur content required to meet standard of 0.8 lbs/million BTU

The standard of 0.8 pounds of sulfur dioxide per million BTU would be applied to emissions for facilities converted from other fuels to oil. The rationale follows that given above for coal-fired operations.

Combustion Turbines

These are used largely for peaking operations. There is little likelihood that natural gas will be used as a fuel for such sources in the near future. The major fuel will be oil for new sources and sources converted from natural gas use. The Commission adopted the same standards for emissions from combustion turbines as for emissions from oil-fired operations. High quality distillate will be required.

Little testimony was presented on this issue.

Natural Gas Desulfurization

Natural gas (primarily methane) is a clean and desirable fuel for household use. It is considerably more efficient for such use than electrical energy obtained from coal combustion. The conversion efficiency for the conversion of coal to electrical energy is on the order of 30%; the conversion of the chemical energy of natural gas to thermal energy is on the order of 80%.

Much natural gas as it comes from the well is "sour"; i.e. contains significant and varying concentrations of hydrogen sulfide. This substance must be removed before the gas is put into the pipeline. For smaller sources, the waste hydrogen sulfide may be "flared" and converted into sulfur dioxide and emitted as such. For larger sources, the gas is desulfurized by means of a process which converts the hydrogen sulfide into elemental sulfur. Sulfur dioxide is emitted as a by-product in such a process. Control technology exists for reduction of all such sulfur dioxide emissions.

The caloric content of natural gas is on the order of one million BTU per 1,000 cubic feet. Small coal-fired electrical generating facilities have been assigned an emission standard of 1.2 pounds per million BTU. Considering the greater efficiency of natural gas in its usage (by factor of 80/30) it is reasonable to adopt a higher emission rate per unit of energy for natural gas desulfurization. However, the stacks employed in such desulfurization are lower than those normally used in coal-fired generation operations and hence, contribute significantly to increased ambient levels. A balancing process for establishment of these emission standards has therefore become necessary.

Application of highly efficient sulfur dioxide removal equipment may be prohibitively expensive for small sources. The Commission has, after review of the short stack considerations, decided to adopt a break point between large and small sources of 3 tons of sulfur dioxide emissions per day. The applicable standard for such small sources is set at 2 pounds of sulfur dioxide per 1,000 cubic feet (one million BTU). This recognizes the greater thermal efficiency of natural gas while minimizing impact on ambient air quality.

For larger sources, the emission standard of 0.8 pounds of sulfur dioxide per 1,000 cubic feet of gas delivered to the pipeline gives weight to the increased energy efficiency of natural gas, as compared to coal, for the generation of applicable power. (This standard is roughly twice that for coal-fired operation.) Suitable technology is available for control in such large sources. Again little testimony was presented at the hearings. Table IV contains some pertinent data with respect to natural gas desulfurization.

TABLE IV
NATURAL GAS DESULFURIZATION

Vol. % CO ₂	Vol. % H ₂ S	lbs. SO ₂ /1,000 Cubic feet	% Removal (2.0 lbs.)	% Removal (0.8 lbs.)
10	16	38.6	95	98
	14	32.9	94	98
	12	27.5	93	97
	10	22.3	91	96
	8	17.4	89	95
	6	12.8	84	94
	4	8.3	76	90
	2	4.1	51	80
	1	2.0	--	60
	1.5	1.0	--	20
0	16	34.0	94	98
	12	24.3	92	97
	8	15.5	87	95
	4	7.4	73	89
	1	1.8	--	56
	0.5	0.9	--	11

Permitted Production per day in Cubic
Feet at Uncontrolled 3 tons of Sulfur
Dioxide per day
(Million cubic feet)

16	0.177
12	0.247

TABLE IV
NATURAL GAS DESULFURIZATION

Vol. % CO ₂	Vol. % H ₂ S	lbs. SO ₂ /1,000 Cubic feet	% Removal (2.0 lbs.)	% Removal (0.8 lbs.)
	8		0.387	
	4		0.811	
	1		3.334	
	0.5		6.666	

Petroleum Refining

The prediction and analysis of sulfur dioxide emissions from the refining of crude oil presents a complex problem. The sulfur content of the crude oil varies; the sulfur content of the various portions of refined products varies as does the mix of these products; the emissions are from several processes. The refineries now in operation in Colorado range in capacity from 6,000 to 35,000 barrels per day. The largest refinery processes crude oil with an average sulfur content of 0.9% and a range of about a factor of 2. This crude is considered "sour"; i.e. containing a significant concentration of elemental sulfur. Some sulfur dioxide escapes in this process as well as from other operations in the refining cycle. It is estimated that the total emissions from this refinery range from 10 to perhaps 15 tons per day. With a 35,000 barrel a day capacity the emission rate is thus 0.57 - 0.86 pounds of sulfur dioxide per barrel of oil processed.

Little evidence was presented to the Commission regarding technical aspects of new petroleum refining facilities. Further study by the Commission and staff indicate that (1) emission standards should be set for the overall operation rather than on standards for the separate process units due to the complexity of this operation (2) that technology for new operations is available (tail-gas scrubbing) that would lower the emissions by at least a factor of three, and (3) such technology is economically feasible for new construction. The Commission therefore adopted an emission standard of 0.3 pounds of sulfur dioxide per barrel of oil processed. Under this standard a 40,000 barrel a day plant would emit per day 6 tons of sulfur dioxide, equivalent to the emissions from a controlled 140 megawatt electrical generating facility.

Production of Oil from Shale

Due to the complexity of sulfur dioxide emission sources in a shale oil production facility, whether it involve surface retorting or "in situ" production, the Commission adopted an emission standard which relates the permitted sulfur dioxide emission to the operation as a whole (in terms of quantity of oil produced).

Some conflicting evidence was presented to the Commission on this issue. The proposed Union Oil Plant would purportedly emit 6 tons of sulfur dioxide per day and produce 71,000 barrels a day; the emission rate would be 0.17 pounds of sulfur dioxide per barrel of oil produced. The proposed Colony surface retorting facility was described as emitting 3.9 tons per day with production of 43,000 barrels a day. The emission rate will be 0.18 pounds per barrel. Testimony from Standard Oil of Indiana projected an emission rate for a modified "in situ" process of close to a full pound of sulfur dioxide per barrel. This latter figure has, however, been significantly reduced, in the detailed development plan for this project, to 0.3 pounds of sulfur dioxide per barrel of oil. The "in situ" process may offer other significant advantages in environmental impact over surface retorting. It was the decision of the Commission, therefore, to adopt an emission standard for large oil shale production facilities of 0.3 pounds of sulfur dioxide per barrel of oil produced. This standard is to be applied to the total of such emissions from the production facility. The Commission anticipates the construction of small experimental units to test new methods for the production of oil from shale. The nature of sulfur dioxide emissions from such sources would not be precisely known, nor would the total emissions be large. The Commission has therefore decided to exempt sources with a production rate less than 1,000 barrels a day from process emission standards.

Under these standards, the emission rate for a 50,000 barrel a day operation would be 7.5 tons a day which is equivalent to the emissions from a controlled 130 megawatt electrical generating plant.

Refining of Oil Produced from Shale

It appears that the sulfur content of the shale oil delivered to the refineries will be on the order of one percent. This is similar to the oil now being processed in the Conoco refinery in Denver. The same argument would therefore apply here as was advanced for the refining of conventional crude oil. The emission standard for large operations is thus set at 0.3 pounds of sulfur dioxide per barrel of oil refined.

Again the Commission has decided to exempt small experimental operations from process standards. The cut-off has been set at 1,000 barrels per day. Taking an extreme point of view (all the sulfur is emitted as sulfur dioxide and none retained in the product) the daily emissions from a 1,000 barrel a day operation would be 2.8 tons of sulfur dioxide per day which is equivalent to the emissions from a controlled 50 megawatt electrical facility.

Sulfuric Acid Production

These are the EPA New Source Performance Standards and will require installation of control devices that are available.

Any Sulfur Dioxide Source Not Specifically Regulated Above

No evidence was introduced concerning such emissions. The Commission is not aware of plans for construction of such sources or the nature of the sources. It is proposed, consistent with the general philosophy concerning small sources, to exempt sources with an emission rate of less than two tons per day (equivalent to the emissions from a controlled 36 megawatt installation) from process

standards. For new large sources the application of best practical control technology will be required. Due to the unknown nature of these new sources, it is impossible to specify process emission rates, the nature of the control technology, and its efficiency. The Air Pollution Control Division in its evaluation of the permit application is charged with determining whether best practical control technology will be utilized. The Commission reserves the right to review such decisions.

Adopted: August 11, 1977

COLORADO AIR POLLUTION CONTROL COMMISSION

RATIONALE AND JUSTIFICATION FOR THE AMENDMENT OF
AIR QUALITY CONTROL COMMISSION REGULATION NO. 1, SECTION IV,
BY ADDING A NEW SUBSECTION D.

On April 9, 1981 the Air Quality Control Commission adopted an Amendment to Air Quality Control Commission Regulation No. 1, Section IV. concerning Limitation on Emissions from Sinter Plant Windboxes at Existing Iron and Steel Plant Operations.

Colorado's only existing sinter plants at iron and steel facilities are located at the CF&I plant in Pueblo, Colorado. The Pueblo area is currently designated by the U.S. Environmental Protection Agency (EPA) as non-attainment with respect to the National Ambient Air Quality Standards (NAAQS) for total suspended particulates.

Section 172(b)(3) of the Federal Clean Air Act requires that State Implementation Plans for non-attainment areas require reduction of emissions from existing sources through adoption, at a minimum, of Reasonably Available Control Technology (RACT).

EPA has proposed conditional approval of the Pueblo element of the Colorado State Implementation Plan in the December 12, 1980 Federal Register (45 Fed. Reg. 81789). In that proposed rulemaking notice, EPA indicated that the Air Quality Control Commission's existing emission limitations for various sources at existing iron and steel plants do not represent Reasonably Available Control Technology and proposed approval of the Pueblo element of the SIP on condition, among others, that the Air Quality Control Commission emission control regulations for existing iron and steel plants be revised to represent RACT.

In response to the requirement of section 172 of the Clean Air Act and EPA's proposed conditional approval of the Pueblo element of the SIP, the Commission is conducting public hearings to review and revise as appropriate, emission control regulations for sources at existing iron and steel plants. Because of an existing compliance order issued by the Air Pollution Control Division and affirmed by the Air Quality Hearings Board, requiring CF&I to bring its sinter plant into compliance with existing standards, the Commission decided to conduct rule making with respect to sinter plants as early as possible.

With respect to the interpretation of the numerical standard "0.03 gr/dscf", such standard is intended to be interpreted as an absolute standard such that any emissions in excess of 0.03 gr/dscf, no matter how minimal, shall constitute a violation. In other words, the Commission is approving the Air Pollution Control Division's past and continuing interpretation of numerical standards as if they were followed by an unlimited number of zeros. This interpretation by the Air Pollution Control Division is approved on the understanding that the Air Pollution Control Division would normally not initiate enforcement action for extremely minimal violations (e.g., 0.0301).

The Air Quality Control Commission determined that there was no legal basis for adoption as part of the regulation of an exemption for CF&I from enforcement of the applicable existing, less stringent emission limitation (.037 gr/dscf equivalent) while CF&I implements the new, more stringent 0.03

gr/dscf standard. The Air Quality Control Commission acknowledges that the Air Pollution Control Division, not the Air Quality Control Commission, is charged by statute (C.R.S. 1973, 25-7-115) with enforcement of emission control regulations and trusts all relevant factors (including CF&I's efforts and success in complying with existing standards) will be considered by the Air Pollution Control Division in exercising its enforcement authority.

AIR QUALITY CONTROL COMMISSION

ADOPTED: April 9, 1981

STATEMENT OF BASIS AND PURPOSE

Emergency Amendment to Regulation No. 1 Section III.D.1. (Fugitive Particulate Emissions)

On April 8, 1982, the Air Quality Control Commission adopted a new Regulation No. 1 which was scheduled to become effective May 30, 1982. On April 19, 1982, the Attorney General for the State of Colorado, in accordance with the provisions of C.R.S. 1973, 24-4-103(8)(b), issued an opinion as to the legality and constitutionality of the new regulation and disapproved in part Section III.D. of the regulation (concerning control of fugitive particulate emissions).

Recognizing that the Attorney General's opinion raises a substantial question as to the validity of portions of Section III.D. of the regulation (and poses significant problems with respect to enforcement of said regulation; finding that having an enforceable regulation for the control of fugitive particulate emissions necessary to the preservation of the public health and welfare; and in order to avoid the circumstance of not having an enforceable regulation for the control of fugitive particulate emissions for any significant period of time [as would result if the normal rulemaking procedures were followed]); the Air Quality Control Commission has determined adoption of amendment to Section III.D. of the Air Quality Control Commission Regulation No. 1 is imperatively necessary for the preservation of the public health and welfare and that compliance with the normal rulemaking procedural requirements of C.R.S. 1973, 24-4-103 would be contrary to the public interest.

Air Quality Control Commission
Adopted: August 26, 1982

STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE

for
REVISIONS TO REGULATION NO. 5
concerning
Alfalfa Dehydration Plants

"Regulation No. 5" and sections II.A.6 and III.C. of "Regulation No. 1" have previously exempted, until January 1, 1985, existing alfalfa dehydration plants from the 20 percent opacity standard otherwise applicable to sources of air pollution. In these amendments to "Regulation No. 5" and sections II.A.6. and III.C. of "Regulation No. 1" the commission has extended that exemption until January 1, 1987, in order to give the one existing alfalfa dehydration plant in Colorado an opportunity to come into compliance with the 20 percent standard. The commission expects compliance to be achieved by that date, and does not intend, through these amendments, to indicate that it will accept a permanent exemption from the 20 percent standard.

ADOPTED: January 19, 1985
COLORADO AIR QUALITY CONTROL COMMISSION

STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE
REGULATIONS 1 and 5
concerning
Alfalfa Dehydration Plant Drum Dryers

The revisions to Regulations 1 and 5 described below were adopted by the Air Quality Control Commission of the State of Colorado on January 15, 1987. This Statement of Basis, Specific Statutory Authority and Purpose is required by Section 24-4-103, C.R.S.. The specific statutory authority for these changes is Sections 25-7-105, -106, and -110, C.R.S..

The Air Quality Control Commission's Regulation 1 and the recently expired Regulation No. 5 provided that existing alfalfa dehydrating plants must operate so as not to exceed 40% opacity. This extension was adopted in January of 1985 and extended this exemption (40% opacity limit) until January 1, 1987, at which time Regulation No. 5 terminated. Existing alfalfa dehydrators then fell under the provisions of Regulation No. 1. The effect of this is to require existing alfalfa dehydrators to meet 20% opacity limits; thus treating existing plants the same as new plants.

Mr. Graves claims to be the only operator of an existing plant which is subject to these requirements. Mr. Graves has asked the Commission to establish a 30% opacity as the standard for existing plants. In making this request, Mr. Graves has indicated he intends to install reasonably available control equipment as it is made known and to take other steps in revising his process in order to minimize emissions.

ADOPTED: January 15, 1987
COLORADO AIR QUALITY CONTROL COMMISSION

STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE

for revision to Regulation No. 1
Adding a new Paragraph A.9. to Section II.A.
Opacity Requirement Exemption

The Pueblo Army Depot has made application for an air pollution emission permit to dispose of Pershing rocket motors in accordance with the Intermediate-Range Nuclear Forces Treaty, as ratified. From the test static firing of one Pershing rocket motor on May 31, 1988, the Division has determined, by qualified observer, that the opacity of the plume from this activity would exceed the standard of 20% set forth in the Air Quality Control Commission's Regulation No. 1. Therefore, the Pueblo Army Depot, in order to obtain a permit for the destruction of the remaining rocket motors, must obtain a waiver from the above opacity standard, or the permit will be denied. This waiver would be necessary due to the fact that there are no presently available methods to reduce opacity to compliance levels for this source.

The Commission takes this action pursuant to their regulatory authority in Section 25-7-109 CRS.

The Commission has adopted this rule in order to exempt the static firing of intermediate range and shorter range Pershing Missile systems from the opacity limits contained in Regulation No. 1, so long as such static firing results in emissions less than 250 tons per year of any one pollutant, adequate monitoring is conducted, and air pollutants are not emitted in dangerous quantities.

Specific statutory authority for limiting the total emissions to 250 tons per year is provided by Section 25-7-109 CRS. Specific statutory authority for the requirement that the source conduct air monitoring is provided by Section 26-7-106(6) CRS; authority for requiring the source to provide the Division with the results of such monitoring is provided by 25-7-111(2) CRS; specific statutory authority for prohibiting potentially dangerous quantities of any air pollutant is provided by Section 26-7-109(3) CRS.

COLORADO AIR QUALITY CONTROL COMMISSION

Adopted: September 15, 1988

Effective: October 30, 1988

STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE
Sections VII and VIII
Adopted: August 19, 1993

This Statement of Basis, Specific Statutory Authority, and Purpose complies with the requirements of the Administrative Procedures Act, CRS 1973, Section 24-4-103 (4) for adopted or modified regulations.

The Colorado Attorney General's Office had determined that any control strategy for a nonattainment area must be adopted as a State regulation in order for the control strategy to be enforceable by the State of Colorado. Sections 25-7-105 and -109 of the Colorado Air Pollution Prevention and Control Act provides the specific statutory authority to adopt the emission control regulations necessary to assure attainment and maintenance of the National Ambient Air Quality Standards.

The purpose of the revised regulation is to reduce the allowable emission from the affected facilities in the Denver PM10 nonattainment area so that future attainment and maintenance of the PM10 National Ambient Air Quality Standard can be demonstrated. As committed in the Denver PM10 State Implementation Plan (SIP) Element, Regulation No. 1 is being revised to include the stationary source control measures adopted by the Colorado Air Quality Control Commission on May 20, 1993. These revisions establish emission limits for PM10 precursors at Public Service Company's Cherokee, Arapahoe, and Valmont stations. These revisions also require that oil be restricted as a back-up fuel for natural gas at the following facilities: Public Service Company's Zuni, Valmont, and Delgany stations, Fitzsimmons Army Medical Center, US Department of Energy's Rocky Flats Plant, Gates Rubber company, and Coors Brewery (Golden, CO).

The revisions to Regulation No. 1 were developed by the Regional Air Quality Council and the Colorado Air Pollution Control Division. Comments from the affected facilities, the Colorado Attorney General's Office and the US Environmental Protection Agency were utilized in further developing the regulation.

The submittal of these revisions to the Commission demonstrates the Commitment from industry, and local and state governments, and the citizens that they represent, to implement control measures and improve the air quality in the Denver area. The revised Regulation No. 1 will be submitted to the EPA as part of the Denver PM10 SIP Element.

COLORADO AIR QUALITY CONTROL COMMISSION
Statement of Basis, Specific Statutory Authority, and Purpose

Revisions to
Regulation No. 1, Section II.A.1, 4 and 10;
Regulation No. 6, Part B, Section II.C.3.a

(Regarding opacity limitations and sulfur dioxide averaging provisions for coal-fired electric utility boilers during periods of startup, shutdown and upset.)

Adopted: December 23, 1996

This Statement of Basis, Specific Statutory Authority and Purpose complies with the requirements of the Colorado Administrative Procedures Act, section 24-4-103, C.R.S. and the Colorado Air Pollution Prevention and Control Act, sections 25-7-110 and 25-7-110.5, C.R.S.

Basis

Regulations 1 and 6 deal with opacity and sulfur dioxide emissions from various sources. This rule change addresses only coal-fired electric utility boilers. The Colorado Utilities Coalition ("CUC") requested that the Commission modify the existing regulations to provide additional flexibility in meeting the opacity requirements and sulfur dioxide averaging, for coal-fired electric utility boilers during periods of start-up, shutdown, upset, process modification and adjustment of control equipment.

Specific Statutory Authority

The Colorado Air Pollution Prevention and Control Act, section 25-7-109(2), C.R.S., provides the authority for the Commission to adopt and modify emissions control regulations pertaining to visible pollutants, particulates and sulfur oxides. Section 25-7-109(5) authorizes the commission to grant a rule change it feels is appropriate for periods of start-up, shutdown or malfunction or other conditions which justify temporary relief from controls. Section 25-7-105(1) provides the authority for the Commission to make SIP revisions. Section 25-7-133(4)(a) provides the Commission with the flexibility to determine what are necessary elements for the SIP. The Commission's action is taken pursuant to authority granted and procedures set forth in sections 25-7-105, 25-7-109, and 25-7-110, C.R.S.

Purpose

The revisions to Regulation No. 1 and No. 6 are intended to provide a specific amount of flexibility related to compliance with opacity limitations and sulfur dioxide averaging provisions for coal-fired electric utility boilers during periods of startup, shutdown and upset. These revisions replace what is believed to be a problematic standard for these specific sources. CUC has demonstrated that there are instances during which these sources cannot comply with the 30% opacity limit and the SO₂ emissions limit during start-ups and shutdowns. Although these sources may exceed the opacity

limit, CUC has presented the Commission with a study prepared by Radian Corporation, which concludes that removing the 30% opacity limit for these sources will not result in such an increase in emissions that Colorado will likely violate the National Ambient Air Quality Standards or other federal requirements. CUC proposed replacement of the 30% limit with a standard that more closely mimics the federal standard, and which these sources will have more certainty complying with, particularly for Title V compliance certification requirements. CUC also provided an ambient air analysis related to SO₂ emissions which concluded that allowing a modification of SO₂ limitations for the periods of startup, shutdown and malfunction would have no adverse impact on related federal requirements.

The Division agreed that some flexibility in complying with the 30% opacity limit was appropriate for these sources. The Division also proposed replacing the 30% opacity limit.

Action Taken

The Commission concludes that a rule change is appropriate for this category of sources and is removing the application of the 30% opacity limitation to these sources during periods of start-up, shutdown and upset. In addition, the Commission agrees that a rule change is merited from the current treatment of SO₂ emissions during periods of start-up, shutdown and malfunction. The Commission also concludes that this rule can be made clearer and easier to implement through the changes adopted.

The Commission adopts language substantially similar to the federal New Source Performance Standard requirement that, during periods of startup, shutdown and malfunction, these sources, to the extent practicable, shall maintain and operate associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. In the Commission's view, incorporating this standard will provide an important balance to the removal of the 30% limit.

The federal New Source Performance Standard refers to "malfunctions", while the Commission has adopted an □upset□ provision. The Commission finds that these two terms are substantially similar, with the exception that an upset must be properly reported to the Division to be excused. In order to avoid confusion, the Commission decided to use the term upset consistent with the Common Provisions Regulation.

The Division expressed concern that the "good practices" standard is subjective and requires substantially more resources to enforce than a numerical limit. In addition, without the 30% limit, opacity from these facilities could be at very high levels for periods of time. The Commission concurs and in this regulation adopts the Division's proposed measures to limit the overall time during which a source may exceed the underlying 20% opacity restriction.

Good Air Pollution Control Practices

This regulation sets overall limits, by percentage of operating time, during which opacity may exceed 20% and SO₂ emissions may exceed regulatory maximums. In the Commission's view, this will allow more flexibility for the utilities without leaving them free of reasonable restriction. The

percentages were determined based on a percentile of the exceedence times for all such sources within the state. Exceedence times were calculated based on the excess emissions reports submitted by each of the utilities over the last several years. These times included the periods of excess emissions due to the events listed in Regulation No. 1, section II.A.4 [fire building, cleaning of fire boxes, soot blowing, start-up, process modification and adjustment or occasional cleaning of control equipment], as well as shutdowns and upsets. Accordingly, the data upon which the Commission based its adoption of the percentages used to define good air pollution control practices included all times during which a source exceeded the applicable opacity limitation. In turn, the percentages adopted as the definition of good air pollution control practices include all times during which a source exceeds the 20% opacity limitation. Thus, all periods of start-up, shutdown, upset, fire building, process modification and adjustment or occasional cleaning of control equipment will be counted against the unit's compliance with the percentages.

This general rule does not apply in two circumstances. First, start-ups following planned maintenance outages which require significant changes at the facility are treated separately, because the Commission concluded that these infrequent events posed particular difficulties for the utilities. It appears that the duration of these events can not be reasonably predicted and they are not to be included in the calculation of the source's compliance percentages. However, in order to ensure accountability of these sources during planned outages, the Commission is imposing requirements for advance notice to the Division. Advance notice will ensure that these are, indeed, planned outages. The notice must include a plan for minimizing emissions and an estimate of the time during which controls will not be operable while the unit is in operation, both in order to prevent inordinate startups beyond reasonable limits. During start-ups, the source must still use good air pollution control practices. An additional definition of start-up is provided to add certainty for all concerned about the duration of these significant planned outage start-ups. In addition, the Commission restricts the application of the planned maintenance outage exception to events requiring significant changes at the facility, such as replacement of major facility components or installation of new processes (e.g., installation of low NO_x burners). This exception addresses changes from which the resulting impact on plant operations cannot accurately be predicted. The exception is not intended to allow exclusion of excess emissions resulting from routine maintenance outages, such as annual replacement of standard equipment, from calculation of the exceedence percentage time allowance.

Second, opacity emissions which are not a result of the combustion of fuel in the steam generating unit are excluded from the calculation of the compliance percentage. This approach is consistent with the federal New Source Performance Standard found at 40 CFR Part 60, Subpart Da. The Commission concludes that these emissions control measures are not intended to limit emissions from cleaning of fire boxes, soot blowing and other activities when a unit is off-line, i.e., when no fuel is being fed to the unit. In addition, there are technical concerns related to the ability of monitoring devices to operate accurately when the unit is off-line.

The Commission agrees that all of these sources can perform somewhat better and intends that the percentages will serve as an achievable measure of good air pollution control practices during these specific periods. This approach will also force poorer-performing facilities to improve their operations and maintenance practices and bring their exceedence levels down to one more consistent with that at other facilities. For baghouse-equipped boilers, a single percentage will suffice for the

indefinite future. However, utility units using electrostatic precipitators to control particulate emissions present more complicated issues. Accordingly, the Commission elected to provide an interim period of approximately three years during which these units will have a higher allowance percentage.

The Commission does not impose at this time a requirement for electrostatic precipitator-equipped facilities to achieve the same exceedence percentage time allowance as baghouses. However, the Commission's ultimate goal is for ESP-equipped facilities to meet the same compliance standard as is today imposed on baghouses.

The Commission endorses the concept that the utilities conduct a study to evaluate operations and maintenance practices and equipment modifications at ESP-equipped facilities. The purpose for this study is to improve understanding of the operators, the Division and the Commission related to ESP operations and potential improvements. The results of this study are not intended for use as evidence that pre-study operations do not constitute good air pollution control practices.

The Commission did not agree with the CUC proposal for limitations on the duration of individual incidents of start-up and shutdown because this approach also is subjective and would require more resources to enforce. The Sierra Club proposal, although substantially similar to that presented by the Division, would require enforcement with exceedence allowances calculated for each ESP-equipped facility. The Commission is not convinced that the benefits of a more specific exceedence allowance justify the resources required to enforce these percentages.

The allowance percentages will give both sources and the Division a clear definition and reasonable limits to the concept of "good air pollution control practices." This definition limits sources from arguing that longer periods of exceedence are good practices. The definition is also intended to allow the Division to investigate the source's practices and determine whether, in light of their compliance history, process and control equipment and operations and maintenance procedures, the source is using good practices. This treatment of good practices will in no way prevent the Division from initiating an enforcement action if the Division determines that a source is not using "good air pollution control practices," regardless of the amount of time the source has been in violation of the 20% opacity standard. The Division may use any available information in order to evaluate whether the source is using good practices.

Federal and State Statutory, and State Implementation Plan, Issues

The Commission is cognizant that section 193 of the federal Clean Air Act precludes revisions to the state implementation plan relating to nonattainment areas which do not provide equivalent or greater emissions reductions to the existing provisions of the plan. Even under this federal law, however, the Commission is entitled to modify its plan to make it more cost-effective and to improve overall compliance and implementation. The Commission concludes that the Division's proposal does not represent a relaxation of the existing rule. The regulatory change removing application of the 30% opacity limit appears on first impression to relax requirements for these units. However, by limiting the overall time during which the units may exceed the 20% opacity limit, the Commission believes

this approach will result in at least the same levels of compliance with the opacity standard and will likely result in lower overall emissions.

The Commission is also aware that section 110 of the federal Clean Air Act imposes additional limitations on revisions to the state implementation plan. CUC presented information relating to the impact of its proposal on ambient air concentrations. The Commission relied on this information, although it did not adopt the CUC proposal for defining and limiting "good air pollution practices." The Commission concludes that the changes made in this rulemaking will not lead to increased emissions in amounts substantial enough to interfere with the state's programs to attain and maintain the NAAQS or any other federal requirements.

The Commission also has evaluated the proposal adopted pursuant to the standards of section 25-7-105.1, C.R.S. This rule change and the compliance levels adopted today for these limited periods for coal-fired electric utility boilers clarify the federal narrative standard adopted, providing both the utilities and the Division with greater levels of certainty. The levels also put a practical limit on excursions by these sources above the opacity and SO₂ emissions limits and aid in ensuring that the NAAQS are attained or maintained and that no other applicable requirements are adversely affected.

The Commission has determined that continued enforcement of the Regulation No. 1 opacity provisions were relied on in development of the Denver PM₁₀ element of the state implementation plan. The provisions deleted from Regulation No. 1 pertaining to electric power plants therefore must be replaced with substantially equivalent requirements. In the past, the Division's enforcement discretion has been exercised to effectively allow 5% noncompliance by these sources. Substantial regulatory ambiguity in the opacity limitations applicable to startup and other periods also led to uncertainty and lower compliance levels. These revisions are substantially equivalent or better in their impact on emissions to the results of current law and practice because that past practice led to lower compliance than the anticipated compliance levels which will result from these changes. The Commission finds that these modifications are necessary as parts of the state implementation plan. The Commission also concludes that these revisions are not more stringent than federal requirements, considering the historical "5% policy" used by the Division and EPA. Accordingly, the Commission concludes that these changes should be forwarded to the General Assembly for review and then to EPA for inclusion in the state implementation plan.

Finally, the Commission adopts these rule changes subject to a delayed effective date insofar as the revisions apply to sources within the Denver PM₁₀ nonattainment area. The Environmental Protection Agency has expressed concerns about the potential effect of this rule change on the pending approval of the PM₁₀ element of the state implementation plan for the Denver nonattainment area. In order to ensure that the proposed approval of the PM₁₀ element for the Denver nonattainment area is not endangered, the Commission designates the effective date for these revisions as they apply to sources within this nonattainment area as the date on which EPA approves these changes as a revision to the state implementation plan.

The Commission has taken into consideration the items enumerated in section 25-7-109(1)(b), C.R.S. The Commission also makes the following findings regarding the adoption of these rule changes:

1. The Commission has considered, and has based its decision, on the reasonably available, validated, reviewed and sound scientific methodologies and information made available by the parties.
2. Where these revisions are not administrative in nature, the record supports the conclusion that the provisions adopted will result in a demonstrable reduction in air pollution. This reduction is accomplished because the overall exceedence levels of the facilities will be lowered under the proposal adopted.
3. The revisions selected maximize the air quality benefits of the emissions standards that apply. The revisions selected are the most cost-effective based on the documents submitted by the parties under section 25-7-110.5, and provide the regulated community with flexibility in meeting emissions limitations. Although the overall level of exceedences should be reduced under this rule change, operators of the units affected will have greater flexibility in start-up and shutdown of the facilities without incurring a violation. In addition, the greater levels of certainty provided by these changes will allow operators of affected facilities to more readily certify compliance with these applicable requirements under the Title V operating permit program.

STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE
Revisions to Regulation No. 1, Section II

Adopted: July 17, 1998

The Fort Carson Army Installation has made application for an exemption to the opacity requirements in Regulation No. 1 during training exercises at Fort Carson and the Pinon Canon Maneuver Site that involve the generation of fog oil smoke and the use of other obscurants. Because the purpose in using obscurants is to train troops in situations of limited visibility, the opacity of the smoke generated is close to 100%, which exceeds the 20% standard in the Air Quality Control Commissions Regulation No. 1.

As Fort Carson's training relies, in part, on smoke and obscurant usage, the potential for base closure increases if an exemption is not granted. If closed, projected economic impact within a 50 mile radius of the Installation is estimated at \$621 million annually.

The US Army and the Division have used dispersion models to estimate the air quality impacts from fog oil generation. The impact levels for various averaging periods have been compared to National Ambient Air Quality Standards (NAAQS) for particulate matter and the National Research Council's (NRC) 1997 guideline values for fog oil exposure.

The Colorado Department of Public Health and Environment's Disease Control and Epidemiology Division has reviewed the toxicological data for fog oil and compared that data to the National Research Council (NRC) guideline values. Based on this review the Division feels that under current operating practices fog oil generation is unlikely to cause a serious public health problem.

The modeling analysis suggests that fog oil generation can cause impacts exceeding the NAAQS or NRC guideline values within 3 kilometers of the fog oil generators. Modeled impacts greater than the NAAQS or NRC guideline values may occur at distances of up to ten kilometers depending on the meteorological conditions and the configuration of the fog oil generators. For example, modeling suggests that fog oil generation at a usage rate of 1540 gallons of fog oil over a four-hour period could cause or contribute to a NAAQS exceedence at distances of up to ten kilometers if the plume is transported in the same direction for several hours. Typical U. S. Army fog oil generation requires mobile, as opposed to stationary, source operations. This might limit the potential for such extensive off-site impacts.

The Division has determined that impacts in ambient air should be below the NAAQS and NRC values if standard U. S. Army fog oil generator operations and the mitigation measures in the exemption are followed. These mitigation measures should also address concerns from the United States Environmental Protection Agency that this exemption might lead to a violation of the federal National Ambient Air Quality Standard for PM 2.5. The Commission determines, pursuant to section 25-7-117, C.R.S., that the smoke generation for the training in question is purposefully intended to be at or near 100% opacity and therefore cannot occur in compliance with the 20% opacity limitation in Regulation No. 1. Accordingly, control techniques are not desirable for this

emission of air pollutants. This proposed revision to the state implementation plan is consistent with the legislative policy set forth in section 25-7-102; and adoption of this limited exception is consistent with the requirements of section 110 of the federal act. Regarding this element, the Commission concludes, based on the modeling information presented, that the generation of fog oil smoke will not cause or contribute to a NAAQS violation at the reservation boundary if the proponent operates in compliance with the limitations placed on this exemption. As additional toxicological data on fog oil is expected over the next few years, the Air Quality Control Commission will revisit this exemption based on an evaluation of the Fort Leonard Wood fog oil study, but will not be limited to this report. This report should evaluate the Fort Carson fog oil exemption in Air Quality Control Commission's Regulation No. 1 with regard to the protection of the public health in Colorado.

The Commission takes this action pursuant to their regulatory authority in section 25-7-109 and section 25-7-117.

Findings

This limited exception to the opacity restriction in Regulation No. 1 is not intended to reduce air pollution; accordingly, the Commission makes no findings pursuant to section 25-7-110.8, C.R.S. Pursuant to section 25-7-133(3), C.R.S., the Commission concludes that this limited exemption is not required by federal law nor is it more stringent than federal law.

Statement of Basis, Specific Statutory Authority, and Purpose

Revisions to Regulation No. 1, Section VII, concerning emission limits for electric generating stations

The April 19, 2001 amendments to Regulation No. 1, section VII were adopted to support the redesignation of the Denver metropolitan area to an attainment area for particulate matter. The rule amendments codify emission limitations and shut down requirements for the purpose of incorporating such limitations and requirements into the federally-enforceable SIP.

Basis and Purpose

One of the emission limitations used to show maintenance of the NAAQS (the 20% SO₂ limit for the Public Service Company of Colorado Cherokee facility) was previously found only in a state permit; it was not in a regulation. (Public Service Company is now doing business as Xcel Energy.) In 1997 EPA incorporated the permit for the Cherokee facility, together with the permits for several other stationary sources, into the SIP by reference. The EPA asserts that such incorporation is necessary to the extent the State relies on emission limits in the permits to demonstrate attainment of the PM-10 NAAQS. The incorporation of the permits into the SIP means that any revision to such permits must go through the extensive SIP revision process. The maintenance demonstration also relies on NO_x limitations at the plant. NO_x emissions are already subject to federal regulations that achieve the same result, albeit with a different averaging time and calculation method. EPA, however, has asserted that the limitation must be expressed as a short-term limit incorporated into the SIP. The Division disagrees with EPA's interpretation of federal law, but does not believe that the circumstances warrant challenging EPA's position. Public Service Company has consented to the inclusion of certain SO₂ and NO_x emission limitations (calculated on a rolling thirty-day average basis) in the regulation and the SIP in order to resolve the matter with EPA. EPA has indicated that these limitations are adequate to resolve its concerns and, with them as a substitute, will agree that the Cherokee and all other permits may be removed from the SIP.

Therefore, all permit limits and conditions contained in permits for the following facilities are specifically removed from the SIP: Trigen-Colorado Energy; Public Service Company; Purina Mills; Electron Corporation; Ultramar Diamond Shamrock; Conoco Refinery; Rocky Mountain Bottle; and Robinson Brick. A SIP revision shall not be required to modify permit limits and conditions for these facilities. Any increases in emission limits contained in Regulation No. 1 that are also incorporated into the SIP would require a SIP revision.

For these reasons, the Commission has determined that it is appropriate to include the requirements in the SIP and the regulation. Public Service Company has asked, and the Commission agrees, that these new emission limitations should not become effective unless and until EPA approves the SIP.

In 1998, the Commission approved a voluntary emission reduction agreement between Public Service Company and the Division pursuant to C.R.S. §25-7-1201et seq. Under that agreement as amended, Public Service Company agreed, among other things, that it would permanently shutdown

and retire Arapahoe Units 1 and 2 on January 1, 2003. This retirement of these two units was also used to show maintenance of the NAAQS. Despite the fact that the retirement is an enforceable commitment of the company under state law, EPA objected to the assumption that Arapahoe Units 1 and 2 will shutdown in 2003. The EPA asserts that the maintenance plan must include a federally-enforceable provision mandating the closures. Again, the Division disagrees with the EPA's position and believes that it may properly rely upon the provisions of the voluntary agreement to demonstrate maintenance of the standard. However, again in order to resolve the disagreement with the EPA, the Public Service Company consented to the inclusion of the shutdown requirements in the State regulations and the federally-enforceable SIP.

In the voluntary agreement, the retirement of Arapahoe Units 1 and 2 does not forbid Public Service Company (or some other person) from reusing the Arapahoe 1 and 2 plant site or equipment, provided that such reuse is subject to new source permitting requirements. The Company, as is its right under C.R.S. §25-7-1203(6), consented to the EPA's desire to include the retirement in the SIP only if the SIP and the state regulations recognize that such reuse is allowed subject to the new source permitting requirements. Therefore, the Commission has determined that language in the proposed regulation allowing for such reuse is necessary and appropriate. This language will allow PSCo or some other party to use the Arapahoe Unit 1 or 2 equipment or plant site for the construction and operation of a new source, provided that, depending on its level of emissions, the new source obtains the applicable minor or major source permit.

The Company also asked that the regulatory SIP provision should not apply if EPA disapproves the maintenance plan and redesignation request. Therefore, the regulation expressly states that it will take effect upon EPA approval of the redesignation request. This provision in the regulation is not to be construed to mean that approval of redesignation request is required in order for the voluntary agreement between the State and the Public Service Company to take effect. The regulation is not intended to supercede or modify the agreement. The agreement shall be effective whether or not the regulation takes effect. The Commission adopted the regulation in order to satisfy EPA's demand to incorporate the shutdown requirement in the SIP, without incorporating the entire agreement into the SIP. Only the provisions applicable to the Arapahoe 1 and 2 retirement described in the regulation have been incorporated into the SIP.

Statutory Authority

Specific statutory authority to redesignate areas to attainment is provided in section 25-7-107, C.R.S. (1999). The authority to adopt the regulations necessary to maintain the NAAQS is set out at section 25-7-105(1)(a)(I), C.R.S. The authority to control particulate emissions is set out in section 25-7-109(2)(b), C.R.S.

Findings pursuant to section 25-7-110.8

Section 25-7-110.8 requires the Commission to make specific findings concerning any regulation intended to reduce air pollution. The April 2001 amendments to Regulation No. 1 put into regulation pre-existing requirements. Although the regulations change the averaging time for SO₂ and NO_x limitations, and thus appear to make the existing requirements more stringent, the units were already in

compliance with the revised standards based on the shorter averaging times. Thus, some of the determinations required by section 25-7-110.8 are irrelevant. To address the remaining, applicable requirements of 25-7-110.8, the Commission determines that: (1) all validated, reviewed and sound scientific methodologies and information made available by interested parties has been considered; and (2) the amendments adopted represent the most cost-effective option.

Adopted April 19, 2001

COLORADO AIR QUALITY CONTROL COMMISSION

Statement of Basis, Specific Statutory Authority, and Purpose

Revisions to Regulation No. 1:

Sections II.A. 1-10; II.B.3., II.C.2.d.;
Sections III.A.1.d. A.3.; III.B.4.a. & b.; III.C.2-4;
Section IV.I.; Section V; Section VI.A.f.; Sections VI.B.2. and VI.B.4.(iv); VI.C.1.;
Sections VII.A.1, A.2. & A.3.;
Sections VIII.A. & E.

Adopted: August 16, 2001

This Statement of Basis, Specific Statutory Authority and Purpose complies with the requirements of the Colorado Administrative Procedures Act, section 24-4-103, C.R.S., and the Colorado Air Pollution Prevention and Control Act, sections 25-7-110 and 25-7-110.5, C.R.S ("the Act").

Specific Statutory Authority

The Act, section 25-7-109, C.R.S., provides the Commission the authority to adopt and revise rules and regulations that are consistent with state policy regarding air pollution and with federal recommendations and requirements.

Basis

Regulation No. 1 deals with opacity, particulate, and sulfur dioxide emissions from various sources. This rule revises the title of the regulation, deletes obsolete parts of this regulation and conforms the regulation to the "Credible Evidence" rule adopted by the Commission on April 19, 2001 (refer to Common Provisions Regulation, section II.I.). The rule also deletes section II.A.10. and related provisions concerning good air pollution practices for coal-fired utility boilers. Finally, the rule revises the methodology and calculation for emissions from multiple fuel burning units ducted through a common stack in section III.A.1.d.

Purpose

In April 2001, the Commission adopted the "Credible Evidence" rule into its Common Provisions Regulation, section II.I. That rule allows for the use of any credible evidence for the purpose of submitting Title V compliance certifications or establishing whether a source has violated or is in violation of any emissions standard contained in any regulation that has been submitted to the U.S. Environmental Protection Agency. The revisions to Regulation No. 1 remove conflicting language from Regulation No. 1, and clarify that the EPA Method 9 is the approved visible emissions reference test method for the credible evidence rule. The opacity requirements in Regulation No. 1 were adopted based on the use of Method 9 for determining compliance with such requirements. This action also clarifies that, for purposes of compliance determinations, the particulate emissions standards found in Regulation No. 1 do not include the condensable or "back half" portion of the emissions train.

In 1992, section 25-7-109(8), C.R.S., was added to the Act to prohibit the regulation of most agricultural activities. In some circumstances, however, agricultural open burning may be subjected to Commission regulation (section 25-7-123, C.R.S.). In order to address the confusion regarding open burning of animal parts and carcasses, the rule now expressly states that the open burning of animal parts and carcasses is not exempt from permit requirements. A special allowance to conduct open burning activities without a permit is provided where the State Agricultural Commission declares a public health emergency or a contagious or infectious outbreak of a disease that imperils livestock and diseased carcasses must be destroyed on weekends or holidays. In this case, voice mail messages must be left with the Division and any local health department, and adequate notice must be provided to neighboring residences, schools, and businesses prior to burning. This allows the Division to promptly respond to complaints about smoke from these activities and provides an opportunity for the neighboring community to take steps to minimize smoke exposure, e.g., close windows and schedule indoor activities.

Certain provisions that regulate “grandfathered” sources that do not exist in Colorado, such as wigwam burners, static firing of Pershing missiles at the Pueblo Army Depot, and standards for iron and steel plant operations, are removed. Rocky Mountain Steel Mills is the only iron and steel plant in Colorado, and only those provisions that are relevant to this operation have been retained. Provisions regulating coke ovens at steel mills, blast ovens, basic oxygen furnaces, and sinter plants have been removed as obsolete.

Section II.A.10, and related provisions found in II.A.4. and VI.B., concerning emissions from coal-fired utility boilers, are removed. These provisions were added in 1996, and have never been approved by the U.S. EPA. However, the Commission reaffirms the findings in the Statement of Basis, Specific Statutory Authority and Purpose associated with the 1996 rulemaking. There are technical concerns related to the ability of continuous opacity monitors to obtain accurate readings during periods when the boilers, fans and process equipment at coal-fired electric utility plants are off. As an alternative approach, the Commission has proposed adoption of Affirmative Defense Provisions to be added to the Common Provisions Regulation to recognize the issues related to periods of excess emissions during startup and shutdown conditions of coal-fired utility boilers and other sources. Consequently, leaving these provisions in Regulation No. 1 renders coal-fired utility boilers subject to federal opacity requirements and conflicting and confusing state-only requirements. The Commission wishes to remove such conflict and confusion.

The rule revises section III.A.1.d. to more accurately calculate emissions from multiple fuel burning units ducting to a common stack (because it is not possible to sum the pounds per 10⁶ British thermal units, as is currently reflected in the regulation).

Regarding the approval of alternative performance test methods in sections III.A.2. and III.C.3., the Commission intends that the existing practice of the Division in consulting with the owner or operator of a source regarding appropriate alternative test methods will continue. Those consultations should include discussions why the reference method or other alternative methods are inappropriate. The Commission recognizes that the Division must approve any alternative

test method but that the owner or operator of a source may appeal that determination to the Commission.

In section VII., A.1., A.2. and A.3., the Public Service Compliance date of January 1, 1995 has been deleted as obsolete. In addition, emissions limitations are placed on the Valmont Electric Generating Station in Boulder, Colorado, Units 1, 2, 3, and 4. In reality, Valmont only has a Unit 5, and thus revisions are made to reflect this reality.

In section VIII, fuel restrictions are placed on specified sources. The regulation is revised to reflect a name change of a source and to revise the example of a reporting tool referenced in this section.

The Regulation No. 1 revisions adopted by the Air Quality Control Commission as described above will be submitted to the EPA as part of the State Implementation Plan.

COLORADO AIR QUALITY CONTROL COMMISSION
ADOPTED: August 16, 2001

**Statement of Basis, Specific Statutory Authority
And Purpose
Revisions to Colorado Air Quality Control Commission
Regulation No. 1
January 17, 2002**

This Statement of Basis, Specific Statutory Authority and Purpose complies with the requirements of the Colorado Administrative Procedures Act, section 24-4-103, C.R.S. and the Colorado Air Pollution Prevention and Control Act, sections 25-7-110 and 25-7-110.5 and implements parts of sections 25-7-106(7) and (8), 25-7-114.7 and 25-7-123, C.R.S.

Basis

These rule revisions implement the provisions of Senate Bill 01-214 and relocate, update and reorganize existing provisions of Regulation No. 1 relating to open burning into Regulation No. 9. Regulation No. 9 deals solely with open burning activities. This new regulation contains permitting, monitoring, reporting and fee provisions, as well as requirements particular to significant users of prescribed fire.

Specific Statutory Authority

The Colorado Air Pollution Prevention and Control Act, sections 25-7-109(2)(e) and 25-7-123, C.R.S., provides the authority for the Commission to adopt and modify a program including emissions control regulations to control burning activities. Sections 25-7-106(7) and (8), 25-7-114.7(2)(a)(III) and 25-7-123, C.R.S., set forth specific requirements relating to activities by significant users of prescribed fire, including open burning activities by federal land managers. The Commission's action is taken pursuant to procedures set forth in sections 25-7-105, 25-7-110 and 25-7-110.5, C.R.S.

Purpose

Open Burning

The focus of SB 01-214 is on open burning activities by significant users of prescribed fire. Addressing open burning issues is necessary in order to address emissions from natural and prescribed fires. The Grand Canyon Visibility Transport Commission identified these fires as having enough episodic impact on visibility at class I areas to overwhelm progress made through other emission control measures. The Commission views reduction of visibility impairment from fires as an important component in achieving federal and state visibility goals. This regulation should ensure that users of prescribed fire consider air pollution impacts in making determinations whether, and under what conditions, to use fire for grassland or forest management.

Permitting

The regulation continues the existing prohibition on open burning absent a permit from the division or a local agency. The exemptions from this requirement also remain largely the same. In particular, agricultural open burning activity does not require a permit.

The regulation specifies factors that the division must consider in deciding whether, and under what conditions, to issue a burning permit. These factors differ depending on the type of permit applicable to the proposed activity.

General open burning permits are the basic permits for most burning activities. General permits require that an applicant use best smoke management techniques to reduce or eliminate smoke impacts on the health and welfare of the public. Although the regulation includes a partial listing of methods to minimize fire emissions and smoke impacts, the Commission intends that the division will exercise its discretion to achieve the goals of this regulation without imposing unreasonable conditions. General open burning may be delegated by the division to local counties.

The next category of fire addressed by this regulation is planned ignition fires, which are a subset of prescribed fires for grassland and forest land management. The Commission decided to establish an emissions and smoke *de minimus* threshold below which a permit applicant must only obtain a general open burning permit. For fires that will exceed that threshold, applicants intending to initiate a fire must obtain a permit for a planned ignition fire. Permits for this type of fire must address additional concerns beyond those applicable to general open burning activities. The Commission listed factors for division consideration in determining whether, and under what conditions, to issue a permit. This list is not exclusive and the division may incorporate in permits additional conditions if it finds them necessary to minimize the impacts of fire on visibility and on public health and welfare. These factors focus on identifying and minimizing impacts to smoke-sensitive receptors. In addition, planned ignition permit conditions should ensure that the permittee will take appropriate action to ensure that the fire remains within the terms of the permit or is managed so as to return it within those terms, or that the permittee will suppress the fire if compliance with permit terms cannot otherwise be achieved.

Unplanned ignition fire permits offer persons a mechanism to use fire for grassland or forest management even though the precise time and location of a particular prescribed fire cannot be anticipated. These permits generally will apply to larger parcels of land, in some portion of which unplanned ignition may occur. The purpose of this permit type is to determine before ignition the conditions under which the fire may be used for resource benefit. As with planned ignition fires, permit conditions should ensure that the permittee will take appropriate action to ensure that the fire remains within the terms of the permit or is managed so as to return it within those terms, or that the permittee will suppress the fire if compliance with permit terms cannot otherwise be achieved.

This regulation focuses on fires that a person intends to use for a beneficial purpose, such as grassland or forest management. The Commission distinguished between those fires and wildfires. Wildfires are beyond the scope of this regulation and no permitting requirements apply to a land manager within whose jurisdiction a wildfire occurs.

The Commission also concluded that a public comment opportunity should be available regarding fires with a high smoke risk. The Commission intends that a high smoke risk rating be equivalent to a rating of 41 or greater from the draft Smoke Risk Rating Worksheet prepared by the division in conjunction with some users of prescribed fire and attached to this Statement of Basis and Purpose as Attachment A. The Commission recognizes that the division and users of prescribed fire may find it appropriate to revise the smoke risk rating methodology in the future.

If this is done, the Commission intends that what constitutes a high smoke risk burn will consider at least the same factors as in Attachment A, and the point at which a fire becomes a high smoke risk should be equivalent to a rating of 41 on Attachment A.

The division will determine which fires have a high smoke risk through consideration of the factors reflected in Attachment A. If, after considering these factors, the division concludes that the fire has a high smoke risk, it will allow the public thirty days in which to submit comments regarding whether a permit should be issued and what conditions are appropriate for inclusion in the permit. For planned ignition prescribed fires, the notice will include information about location of the fire, expected burn dates, expected duration of the fire, potential emissions, and potential air quality and visibility impacts at smoke sensitive receptors. The Commission intends that the division either add appropriate conditions or combine permits to prevent circumvention of the public comment requirement, should a permit applicant submit separate applications that may have the effect of dividing burns that are more appropriately considered together. This comment opportunity is subject to the Commission's Procedural Rules and includes the rights to a public comment hearing provided in those Rules. The comment opportunity does not include a right to an adjudicatory hearing to appeal issuance of a permit, as only the permit applicant may request such a hearing. Persons would still have recourse to seek judicial review of permits pursuant to the Administrative Procedures Act.

Significant users of prescribed fire

Senate Bill 01-214 imposes on significant users of prescribed fire additional requirements to ensure that those users consider air quality impacts in making decisions about when, and under what conditions, they will use fire for grassland or forest management. Senate Bill 01-214 defined a significant user of prescribed fire as a person or agency that collectively manages or owns more than 10,000 acres of land and that uses prescribed fire. The Commission enlarged on the part of this definition dealing with use of prescribed fire by establishing a minimum activity level based on PM₁₀ emissions during a calendar year. The Commission concludes that users of prescribed fire at levels below this threshold do not have significant enough an impact on visibility and air quality to justify their inclusion in this part of the smoke management program. This provision will focus the regulatory requirements and the resources of the division and others on the prescribed fires with the greatest potential impact on visibility and human health and welfare. The Commission did not establish a *de minimus* threshold for other open burns, as even

small fires intended to dispose of trash, rubbish and similar materials may have disproportionate impacts on local air quality.

The regulation imposes additional duties on significant users of prescribed fire, consistent with specific requirements in SB 01-214. Section 25-7-106(8)(b), C.R.S., requires that significant users submit planning documents to the Commission for comment and recommendations. This section also anticipates a hearing on the plans to allow public input. This public hearing requirement is similar to public hearing options applicable to major stationary source permitting. Public input on regulatory compliance and permits for major sources is important to public confidence in air pollution control efforts, particularly for long-term planning documents.

The Commission will hold public hearings to review the planning documents and may make comments and recommendations regarding the plans. Open burning permits for general, planned and unplanned ignition fires can only be issued to significant users of prescribed fire if the permit is consistent with the comments and recommendations of the Commission. The Commission intends that, wherever possible, the division will issue a permit with appropriate conditions in order to meet this requirement, rather than denying the permit altogether. This approach recognizes the value of prescribed fire in grassland and forest land management, but ensures that the air quality goals of SB 01-214 and this regulation are adequately protected.

The Commission defined planning documents and tailored the applicable regulatory requirements to focus submittals and Commission review on the process used by a significant user of prescribed fire, rather than on the results of that process in a specific instance. The Commission does not intend to challenge land use decisions made by the land manager. The purpose of the Commission comments and recommendations will be to ensure that the land manager adequately considers air quality impacts when making decisions whether, and under what conditions, to use prescribed fire. The Commission planning document review will focus on how a significant user of prescribed fire will meet the state air quality protection standard expressed in section 25-7-106(7)(e), C.R.S.

Planning documents should summarize the decision process by which the land manager identifies and selects among alternative treatment methods for fuel reduction. The documents should provide a specific description relevant to accomplishment of the state air quality goal expressed in § 25-7-106(7)(e), C.R.S. This requirement will focus the land manager decision-making process on the goals of Senate Bill 01-214.

The Commission recognizes that planning documents will vary in their level of detail and sophistication in describing decision mechanisms used by land managers, particularly during the initial set of Commission reviews. Commission comments and recommendations may extend to beneficial changes in planning documents as well as improvements in the land manager planning process related to consideration of the state air quality goal.

Specific permit conditions may be excluded from a permit if a federal land manager asserts that a federal statute specifically prohibits the compliance with the condition. In adopting this regulation, the Commission made no evaluation whether any particular federal statute or permit condition may justify exclusion of a permit condition. Nevertheless, section 118 of the federal

Clean Air Act, 42 U.S.C. §7418, subjects federal agencies engaging in activities resulting, or which may result, in discharge of air pollutants to state requirements on control and abatement of air pollution “in the same manner, and to the same extent as any nongovernmental entity.” This waiver of federal sovereign immunity allows states to subject federal agencies to any substantive, procedural, permitting, fee or any other requirement. The Colorado General Assembly enacted §25-7-106(7), C.R.S., pursuant to §118 and directed that this subsection be construed to exercise the full extent of the state’s authority regarding pollution from federal facilities. The Commission intends these revisions to comport with §118 and to exercise the state’s authority to its full extent. The Division should consider this intent in deciding whether a federal statute specifically prohibits imposition of a particular permit condition.

The rule also establishes a means for dealing with outdated plans or documents. The Commission chose to view a plan as being outdated upon expiration of the period for which the plan itself states it is applicable, up to ten years. The Commission may make comments or recommendations in the review process that urge a shorter applicable period than anticipated in the planning document. Any such comments will recognize applicable constraints on preparation of updated documents, such as the provisions of the National Environmental Policy Act.

The regulation establishes a means for dealing with lands acquired by a significant user of prescribed fire after the Commission reviews an initial or later version of a planning document. The Commission concluded that requiring changes and further review of planning documents whenever a significant user acquires land would unduly increase the burdens of the review process on the Commission, the division and the land managers. In general, the Commission anticipates addressing planning documents for these lands at the next regular review, so long as the acquired lands will be managed in largely the same way as those already addressed by the Commission. Where there will be a substantial difference in management of the acquired lands, the Commission concluded that the land manager must submit planning documents to address the anticipated management.

Fees and Monitoring

Senate Bill 01-214 directed the Commission to include within its smoke management program provisions for fees necessary to pay for administration of the program. Since the General Assembly granted the direct authority to develop a fee program for the smoke management program, the Commission is not required to utilize the fee mechanism applicable to traditional stationary sources. The Commission chose to apportion the cost of administering the program among users of prescribed fire rather than relying on traditional emissions fees. In part, this conclusion was due to the unique characteristics of this emission source category including highly variable emissions from one year to the next. Therefore, the Commission concluded that the traditional emission fee approach would result in substantially greater administrative burdens for both the Division and for users of prescribed fire. The methodology adopted combines the proportion of the total number of permits and total PM₁₀ emissions of a particular user to determine the appropriate fraction of the program cost payable by that user. This approach will provide an equitable distribution of the costs of administering the common elements of the program. The Commission intends that fees paid by stationary sources will not be used to pay any portion of the smoke management program costs.

The total administrative cost of \$129,646.45 at the outset is specified in an appendix to the regulation and the Commission intends that any change to it or the distribution methodology occur only through a properly noticed public rule-making hearing before the Commission. To that end, the cost is included in the regulation as the regulatory "fee." The division cost for program administration will be recalculated annually and reported to the Commission each August. If the total cumulative dollar difference between the cost reflected in the regulation and the division's annual calculation exceeds five percent, the division will seek a fee change through a Commission rulemaking. The "total cumulative dollar difference" between the regulatory fee and the annual cost will be calculated considering personnel and indirect and operating costs associated with the program, and the cumulative dollar difference from the previous year. This calculation will be performed substantially in accordance with the Colorado Smoke Management Program Cost and Fee Calculation Template (Attachment B). The Commission also intends that the actual revenue collected be reported annually. If collections are consistently below projections, the division shall seek an appropriate fee adjustment consistent with the shortfall in revenue.

In addition, the Commission imposed a fee pursuant to section 25-7-114.7(2)(A)(III), C.R.S., to cover the direct and indirect costs of evaluating planning documents submitted to the Commission. In order to reduce the administrative burden on the division and permittees, both the evaluation fees and the administration fee will be billed annually.

The rule revisions adopted address the procedural mechanisms for accomplishing the mandatory requirements of Senate Bill 01-214. The general structure of the smoke management program has been established by statute. The Commission's rule implements that legislative prescription; the revisions adopted set a *de minimus* level for significant users of prescribed fire, establish a fee mechanism and delineate the specifics of the program anticipated by the statute. The Commission concludes that these rule revisions are adopted to implement prescriptive state

statutory requirements, where the Commission is allowed no significant policy-making options, for the purposes of § 25-7-110.5, C.R.S. The Commission also concludes it has no discretion under state law to adopt alternative rules that differ significantly from these revisions, for the purposes of § 25-7-110.8(1), C.R.S. Accordingly, the Commission did not include in the record some of the portions of the rulemaking prerequisites addressed in § 25-7-110.5, C.R.S., and did not make specific determinations regarding the factors listed in § 25-7-110.8(1), C.R.S.

The Commission took into consideration the appropriate items enumerated in section 25-7-109(1)(b), C.R.S.

COLORADO AIR QUALITY CONTROL COMMISSION

ADOPTED: JANUARY 17, 2002

Statement of Basis, Specific Statutory Authority, and Purpose
Revision to Regulation No. 1:
Section VIII.A
Adopted June 19, 2003

This Statement of Basis, Specific Statutory Authority and Purpose complies with the requirements of the Colorado Administrative Procedures Act, § 24-4-103, C.R.S., and the Colorado Air Pollution Prevention and Control Act, §§ 25-7-110 and 25-7-110.5, C.R.S ("the Act").

Specific Statutory Authority

Section 25-7-107, C.R.S., provides the Commission authority to review the current classification of any attainment, nonattainment, or unclassifiable area within the State. In addition, § 25-7-109, C.R.S., provides the Commission authority to adopt, promulgate, modify and/or repeal emission control regulations that require the use of air pollution controls, including those regulations pertaining to particulates [§ 25-7-109(2)(b), C.R.S.].

Basis and Purpose

Regulation No. 1 deals with opacity, particulate, and sulfur dioxide emissions from various sources. This amendment to Regulation No. 1 revises Section VIII.A, wherein a clerical error, which inadvertently materialized subsequent to the adoption of unrelated revisions to Regulation No. 1 during the August 2001 hearing, misrepresents the Denver area's PM-10 attainment/maintenance status. Section VIII.A erroneously referred to the Denver PM-10 nonattainment area, even though the area has been redesignated to "attainment/maintenance" for PM-10 (50 CFR 81.306). The EPA noted the discrepancy and asked the State to fix it when it approved the Denver PM-10 maintenance plan in September 2002 (40 CFR 52.320(c)(95)(i)(I)). This revision remedies the error.

COLORADO AIR QUALITY CONTROL COMMISSION
ADOPTED: June 19, 2003

APPENDIX A

Method for Measuring Opacity from Fugitive Particulate Emission Sources

- a. Principle and Applicability
 - (i) Principle. The opacity of emissions from fugitive particulate emission sources is determined visually by a qualified observer.
 - (ii) Applicability. This method is applicable for the determination of the opacity of emissions from fugitive particulate emission sources and for qualifying observers for visually determining opacity of emissions; provided, however, this method shall not be used when wind velocities exceed 30 m.p.h. as determined by records from the nearest official station of the U.S. Weather Service, by interpretation of surface weather maps by a qualified meteorologist, or by use of one or more anemometers at the site. The Division shall use anemometers where practicable.
- b. Procedures. The observer qualified in accordance with Section c. of this method shall use the following procedures for visually determining the opacity of emissions:
 - (i) Position. The qualified observer shall stand at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140° sector to his back. Consistent with maintaining the above requirement, the observer shall, as much as possible, make his observations from a position such that his line of vision is approximately perpendicular to the plume direction. The observer's line of sight should not include more than one plume at a time. Where the plume from more than one source have been combined such that it is not possible to observe the emissions from a subject source alone this method shall not be applied to the "combined plume" to determine the opacity of emissions from any of the contributing sources. Emissions from rock or mineral drilling, crushing, conveying, screening, and storing are evaluated in the following manner:
 - (A) Drilling. Emissions from drilling operations are evaluated at the point at which they are released from the drilling device or from the drill hole.
 - (B) Crushing. Emissions included at this evaluation point are released as material is discharged from the primary and secondary crushing machines. Observations are performed on the same elevation as the discharge if possible.
 - (C) Conveying. Visible emissions are evaluated as material is discharged at conveyor belt transfer points and loading points. Evaluation shall occur at the same elevation as the discharge if possible.

- (D) Screening. Visible emissions are evaluated as material is discharged from the screen into the chutes. The observer shall obtain an observation point as close to the same elevation of the screens as possible.
 - (E) Storage. Observations are performed at ground level.
 - (F) In operations involving rock or mineral drilling, moisture content of the material plays an important part in type and quantity of visible emissions. Therefore, any moisture in the feedstock or addition of moisture to the process should be noted on the field data sheet.
 - (G) Emissions from all other sources of fugitive particulate emissions subject to this regulation shall be evaluated in a manner consistent with the above procedures.
- (ii) Field Records. The observer shall record the name of the plant, emission location, type facility, observer's name and affiliation, and the date on a field data sheet. The time, estimated distance to the emission location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), and plume background are recorded on a field data sheet at the time opacity readings are initiated and completed.
 - (iii) Observations. Opacity observations shall be made at the point of greatest opacity in the plume and with a background of contrasting color. The observer shall not look continuously at the plume, but instead shall observe the plume momentarily at 15-second intervals. The observer shall record the approximate distance from the emission outlet to the point in the plume at which the observations are made.
 - (iv) Recording Observations. Opacity observations shall be recorded to the nearest 5 percent at 15-second intervals on an observational record sheet. A minimum of 24 observations shall be recorded. Each momentary observation recorded shall be deemed to represent the average opacity of emissions for a 15-second period.
 - (v) Data Reduction. Opacity shall be determined as an average of 24 consecutive observations recorded at 15-second intervals. Divide the observations recorded on the record sheet into sets of 24 consecutive observations. A set is composed of any 24 consecutive observations. Sets need not be consecutive in time and in no case shall two sets overlap. For each set of 24 observations, calculate the average by summing the opacity of the 24 observations and dividing this sum by 24. If an applicable standard specifies an averaging time requiring more or less than 24 observations, calculate the average for all observations made during the specified time period. Record the average opacity on a record sheet.
- c. Qualifications and Testing
 - (i) Certification requirements. To receive certification as a qualified observer, a candidate must be tested and demonstrate the ability to assign opacity readings in 5

percent increments to 25 different black plumes and 25 different white plumes, with an error not to exceed 15 percent opacity on any one reading and an average error not to exceed 7.5 percent opacity in each category. Candidates shall be tested according to the procedures described in paragraph c. (ii). Smoke generators used pursuant to this paragraph shall be equipped with a smoke meter which meets the requirements of paragraph c.(iii).

The certification shall be valid for a period of six months, at which time the qualification procedure must be repeated by the observer in order to retain certification.

- (ii) Certification Procedure. The certification test consists of showing the candidate a complete run of 50 plumes - 25 black plumes and 25 white plumes - produced by a smoke generator. Plumes within each set of 25 black and 25 white runs shall be presented in random order. The candidate assigns an opacity value to each plume and records his observation on a suitable form. At the completion of each run of 50 readings, the score of the candidate is determined. If a candidate fails to qualify, the complete run of 50 readings must be repeated in any retest. The smoke test may be administered as part of a smoke school or training program, and may be preceded by training or familiarization runs of the smoke generator during which candidates are shown black and white plumes of known opacity.
- (iii) Smoke Generator Specifications. Any smoke generator used for the purposes of paragraph c. (ii) shall be equipped with a smoke meter installed to measure opacity across the diameter of the smoke generator stack. The smoke meter output shall display in stack opacity based upon a path length equal to the stack exit diameter, on a full 0 to 100 percent chart recorder scale. The smoke meter optional design and performance shall meet the specifications shown in Table 1. The smoke meter shall be calibrated as prescribed in paragraph c. (iii)(A) prior to the conduct of each smoke reading test. At the completion of each test, the zero and span drift shall be checked and if the drift exceeds 1 percent opacity, the condition shall be corrected prior to conducting any subsequent test runs. The smoke meter shall be demonstrated, at the time of installation, to meet the specifications listed in Table 1. This demonstration shall be repeated following any subsequent repair or replacement of the photocell or associated electronic circuitry including the chart recorder or output meter, or every 6 months, whichever occurs first.
 - (A) Calibration. The smoke meter is calibrated after allowing a minimum of 30 minutes warm-up by alternately producing simulated opacity of 0 percent and 100 percent. When stable responses at 0 percent or 100 percent is noted, the smoke meter is adjusted to produce an output of 0 percent or 100 percent, as appropriate. This calibration shall be repeated until stable 0 percent or 100 percent readings are produced without adjustment. Simulated 0 percent and 100 percent opacity values may be produced by alternately switching the power to the light source on and off while the smoke generator is not producing smoke.

Table 1

Smoke Meter Design and Performance Specifications

<u>Parameter</u>	<u>Specification</u>
a. Light Source	Incandescent lamp operated at nominal rated voltage
b. Spectral Response of Photocell	Photopic (daylight spectral response of the human eye - reference d(iii))
c. Angle of View	15° maximum total angle
d. Angle of Projection Angle	15° maximum total
e. Calibration Error	. 3% opacity, maximum
f. Zero and Span	. 1% opacity, maximum
g. Response Time	Five seconds

B. Smoke Meter Evaluation. The smoke meter design and performance are to be evaluated as follows:

- (1) Light Source. Verify from manufacturer's data and from voltage measurements made at the lamp, as installed, that the lamp is operated within 6 percent of the nominal rated voltage.
- (2) Spectral Response of Photocell. Verify from manufacturer's data that the photocell has a photopic response; i.e., the spectral sensitivity of the cell shall closely approximate this standard spectral-luminosity curve for photopic vision which is referenced in (b) of Table 1.
- (3) Angle of View. Check construction geometry to ensure that the total angle of view of the smoke plume, as seen by the photocell, does not exceed 15°. The total angle of view may be calculated from: $\theta = 2 \tan^{-1} \frac{d}{2L}$ where θ =total angle of view; d=the sum of the photocell diameter + the diameter of the limiting aperture; and L=the distance from the photocell to the limiting aperture. The limiting aperture is the point in the path between the photocell and the smoke plume where the angle of view is most restricted. In smoke generator smoke meters this is normally an orifice plate.
- (4) Angle of Projection. Check construction geometry to ensure that the total angle of projection of the lamp on the smoke plume does not

exceed 15° . The total angle of projection may be calculated from: $\theta = 2 \tan^{-1} d/2L$, where θ =total angle of projection; d =the sum of the length of the lamp filament and the diameter of the limiting aperture; and L =the distance from the lamp to the limiting aperture.

- (5) Calibration Error. Using neutral-density filters of known opacity, check the error between the actual response and the theoretical linear response of the smoke meter. This check is accomplished by first calibrating the smoke meter according to (1) and then inserting a series of three neutral-density filters of nominal opacity of 20, 50, and 75 percent in the smoke meter path length. Filters calibrated within 2 percent shall be used. Care should be taken when inserting the filters to prevent stray light from affecting the meter. Make a total of five nonconsecutive readings for each filter. The maximum error on any one reading shall be 3 percent opacity.
- (6) Zero and Span Drift. Determine the zero and span drift by calibrating and operating the smoke generator in a normal manner over a 1-hour period. The drift is measured by checking the zero and span at the end of this period.
- (7) Response Time. Determine the response time by producing the series of five simulated 0 percent and 100 percent opacity values and observing the time required to reach stable response. Opacity values of 0 percent and 100 percent may be simulated by alternately switching the power to the light source off and on while the smoke generator is not operating.

References

- (i) Air Pollution Control District Rules and Regulations, Los Angeles County Air Pollution Control District, Regulation IV Prohibitions, Rule 50.
- (ii) Wefsburd, Melving L., Field Operations and Enforcement Manual for Air, U.S. Environmental Protection Agency, Research Triangle Park, N.C., APTD-1100, August 1972, pp. 4.1-4.36.
- (iii) Condon, E. U., and Oldshaw, H., Handbook of Physics, McGraw Hill Co., N.Y., N.Y. 1958, Table 3.1, p. 6-52.
- (iv) EPA Visible Emission Inspection Procedures, August 1975.

APPENDIX B

Method of Measurement of Off-Property Transport of Fugitive Particulate Emissions

- a. Applicability. This method is applicable for the determination of the off-property transport of fugitive particulate emissions sources covered by Section III.D.2 of this regulation; provided, however, this method shall not be used when wind velocities exceed 30 m.p.h. as determined by records from the nearest official station of the U.S. Weather Service, by interpretation of surface weather maps by a qualified meteorologist, or by use of one or more anemometers at the site. The Division shall use anemometers where practicable.
- b. Procedure
 - (i) Position. The observer shall stand at a distance sufficient to provide a clear view of the emissions with the sun oriented in the 140° sector to his back. The observer shall position himself off said property so as to be able to sight along a line which does not cross the property of emission origination. Consistent with maintaining the above requirements, the observer shall, to the extent possible, make his observations from a position such that his line of vision is approximately perpendicular to the plume direction.
 - (ii) Field Records. The observer shall record the name of the plant, emission location, type facility, observer's name and affiliation, and the date on a field data sheet. The time, estimated distance and the emission location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), and plume background are recorded on a field data sheet at the time readings are initiated and completed.
 - (iii) Observations. Observations shall be made in accordance with the provisions of this Appendix B sighting along a line which does not cross the property of emission origination and two such observations of fugitive particulate emissions transported off the property of at least 15 seconds in duration [within 24 hours] must be made and must be separated by at least fifteen (15) minutes.